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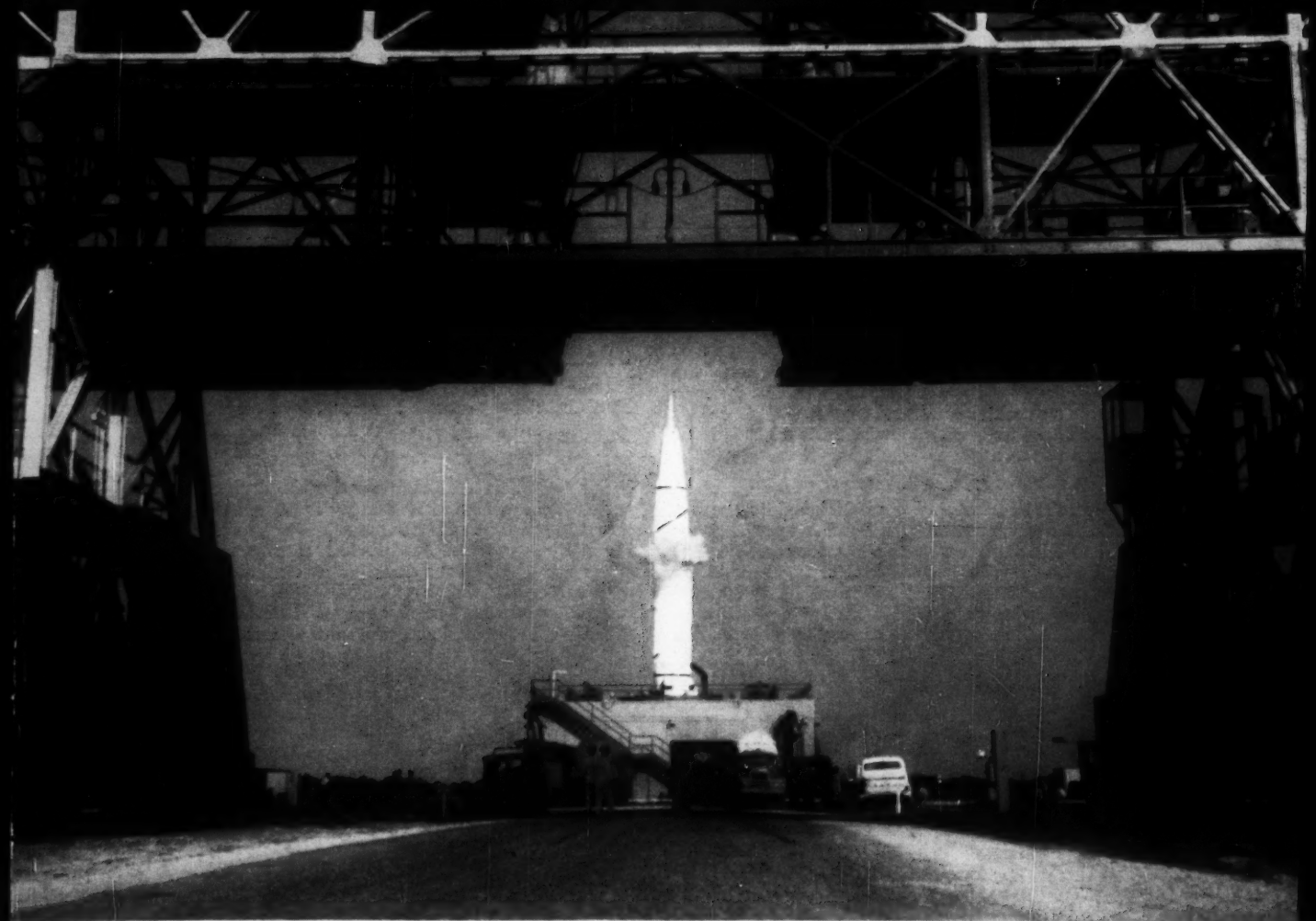

Construction surrounds the missile program pp. 21 & 30

A McGRAW-HILL PUBLICATION

E B POWER
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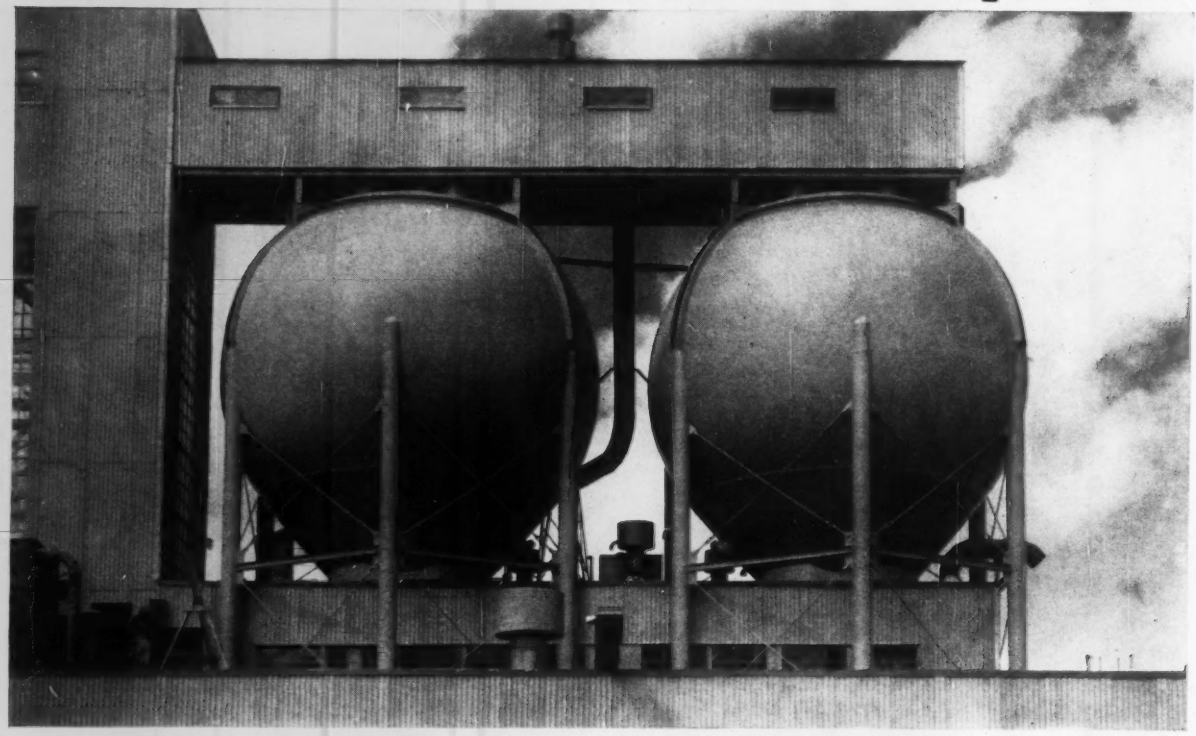
The Case of the Airborne Conispheres:



Why Linde wanted them . . . How CB&I designed and built them

In order to keep a ready and free-flowing supply of calcium carbide available for generation into acetylene, the Linde Company specified that these two 500-ton capacity Conispheres* be installed on the roof of their Montague, Michigan, plant. In order to overcome a specific set of problems it was necessary for CB&I to incorporate special features into their design and construction. Here's how it was done:

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Solution: (1) Structures were designed to meet a specified emergency condition at an increased stress level, as well as to meet normal service conditions at normal stress levels in all parts not governed by explosion conditions. (2) A series of six safety outlets vent tanks upward. (3) Heavy baffle plates were suspended inside the tanks to control flow of carbide.

Problem: *Tanks must support superimposed load of gallery and feed belt equipment.*

Solution: Special framing distributes load to supporting columns of the tanks.

Problem: *Tanks must be mounted on sloping roof.*

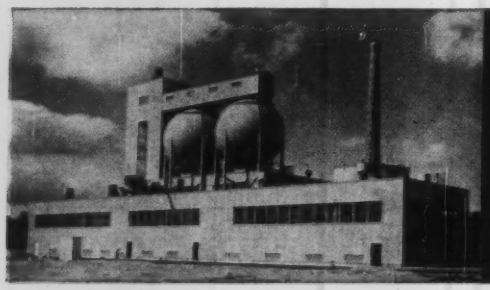
Solution: Three of the supporting columns are longer than others to compensate for roof plane.

Fully coordinated facilities for the design, fabrication and erection of standard or special steel plate structures permits CB&I to work to the most exacting requirements. . . . For this reason industry leaders call on CB&I for the tough jobs and rely on the quality of workmanship that goes into *any* CB&I built structure. A new booklet describes CB&I FIELD SERVICES . . . write our nearest office.

At Montague, Michigan, Linde is one of three major companies combining their talents and mass production facilities to produce DuPont Neoprene. Linde Company is a division of Union Carbide Corporation.

*A Conisphere is a Hortonsphere® designed with conical bottom outlet.

E55C



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To help satisfy California's growing need for home and industrial gas, a new suspension bridge now carries a 34-in. pipe line across the Colorado River and into the Golden State. The scene shown above was photographed while construction work was still under way. When in full operation, the line will handle an estimated 150,000,000 cu ft of natural gas per day.

The bridge has its easterly tower and anchorage in Topock, Arizona. From tower to tower the span is approximately 900 ft. Among the primary components of the bridge are the 2¼-in. main suspension cables, which were furnished by Bethlehem—prestressed and cut to exact lengths. All in all, more than 17 tons of Bethlehem bridge strand is used in main, suspender, wind, and other types of cables. This application of steel strand, a cousin of Bethlehem wire rope, provides exceptionally strong support for the 70 tons of pipe spanning the river.

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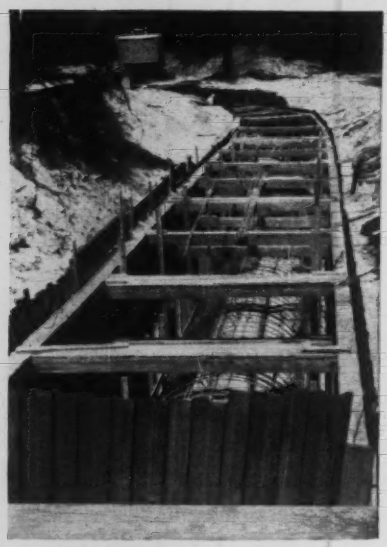

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ENGINEERING NEWS-RECORD, Vol. 160, No. 9, FEBRUARY 27, 1958

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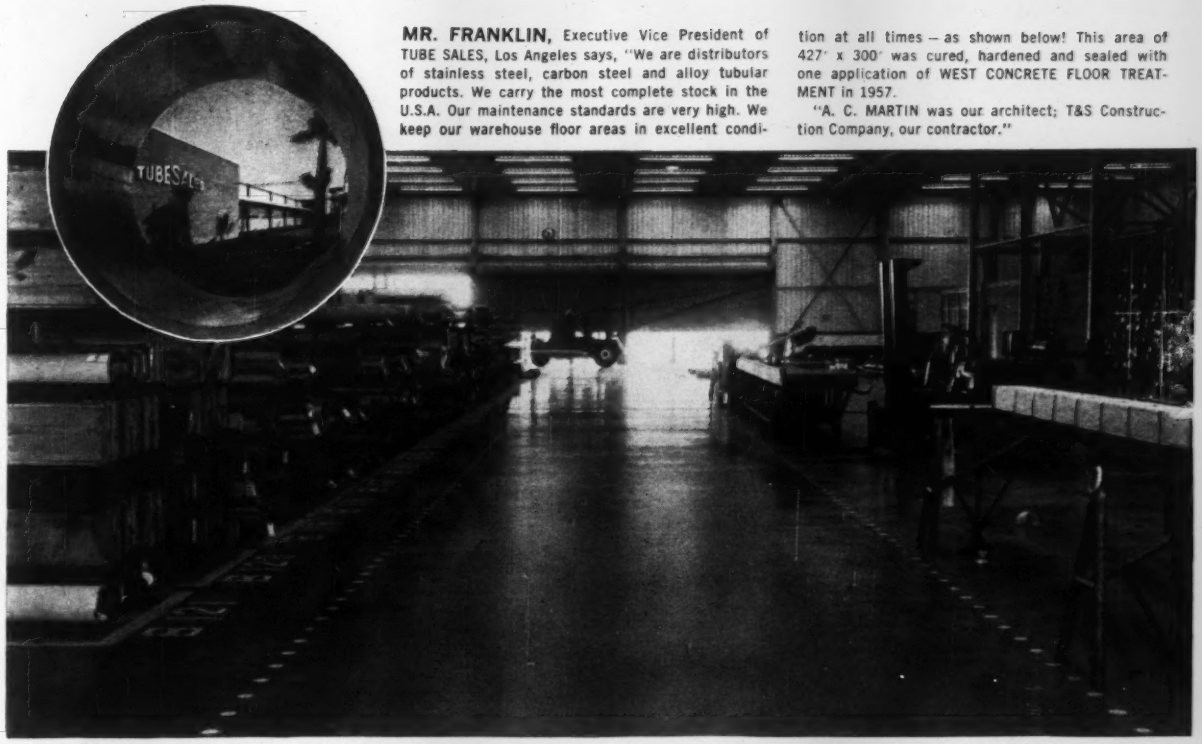

MR. FRANKLIN, Executive Vice President of TUBE SALES, Los Angeles says, "We are distributors of stainless steel, carbon steel and alloy tubular products. We carry the most complete stock in the U.S.A. Our maintenance standards are very high. We keep our warehouse floor areas in excellent condition at all times – as shown below! This area of 427' x 300' was cured, hardened and sealed with one application of WEST CONCRETE FLOOR TREATMENT in 1957.

"A. C. MARTIN was our architect; T&S Construction Company, our contractor."

ONE APPLICATION OF ONE CONCRETE FLOOR TREATMENT

CURES · HARDENS · SEALS CONCRETE SURFACE

WEST Concrete Floor Treatment is a proven time-saving, labor-saving product that 1) Cures 2) Hardens 3) Seals newly-laid concrete surfaces with *one* application. It is a rubber based formulation with a quick drying solvent. Formerly as many as three separate products and applications were needed to obtain the same results.

WEST Concrete Floor Treatment can be applied immediately after horizontal surfaces have been troweled or as soon as the concrete can be walked on. Usually in *one* to *eight* hours. It is applied quickly and easily with a lamb's wool applicator or standard hand pump sprayer. All the labor formerly required for cleaning the concrete surface after delayed concrete drying, and between the use of as many as three separate products and applications is eliminated.

WEST Concrete Floor Treatment is applied immediately after troweling. Its fast drying permits subsequent building operations to be speeded. It also dustproofs as it seals. This speeds the final cleaning. All foreign matter is easily flushed off the surface.

WEST Concrete Floor Treatment enables newly-laid, wet concrete to retain 95% of its moisture. This permits it to cure and harden while sealing the surface against acids, oils, greases and other foreign matter. This incongruous aspect of holding back most of the moisture while permitting some moisture to escape slowly is the key to this product's amazing success.

WEST Concrete Floor Treatment is colorless and will not alter the color of the poured mix. It goes on evenly and spreads quickly without streaks. One gallon covers from 300-350 sq. ft.

WEST Concrete Floor Treatment is fully attested, fully proven across the United States and Canada. Full details and samples are available immediately from any of WEST's 400 specially trained representatives from coast to coast. Write, phone or wire your nearest WEST office.

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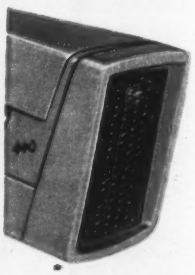
With a capacity for work that must be seen to be believed, combined with a nimbleness that cuts maneuvering time drastically, these tractors have the ability to squeeze more work out of every piece of equipment and to press more work into every hour.

New Heavy-Duty Track Assembly—Simple Adjustment

New strength . . . new durability . . . in power train and in 5-roller track assembly assure outstanding traction and greater lugging capacity. Wide choice of track shoe sizes, including a new 12-inch all-purpose shoe, assures traction aplenty on any type or combination types of industrial jobs. Clutch-brake steering assures "turn-on-a-dime" maneuverability.

New, Heavy Buffer-Type Front End

The strictly industrial design of the "440" is most evident in the husky front end—an immediate outward indication of the tractor's solid brawny strength throughout. No grille guard is required. Room is provided for front crankshaft-driven pumps.



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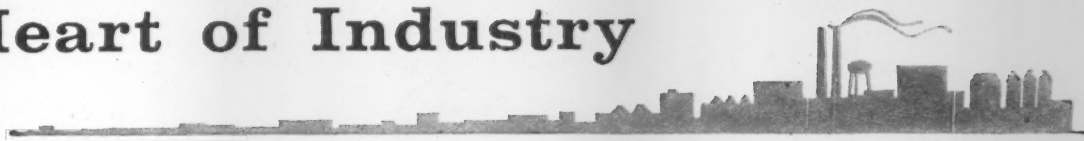
New comfort and protection for the operator . . . new eye-centered controls and gauges . . . new easy view of work being done—all are here in full measure. Result—an easy-handling smooth-working unit that means more productive hours on the job, less operator fatigue.

New, Clutch-Type Direction Reverser (Optional)

The new clutch-type direction reverser is simple, easy to use, and effective. A touch of the handy lever and the tractor travels forward or backward at the same speed. It is not necessary to shift gears.

. . and Sure·to Win·Their Way to the Heart of Industry



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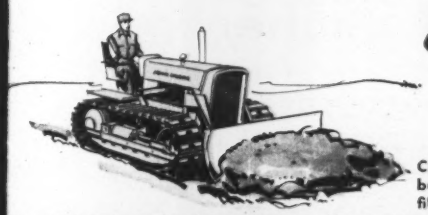
"Born" to save you money?

We could hardly put it better. For these are INDUSTRIAL tractors from top to bottom . . . ruggedly built from grille to drawbar . . . and designed, inside and out, to fill definite needs in industrial work of all types . . . to cut to rock bottom the costs of such jobs as earth moving, materials handling, sand and gravel work, maintenance, and many other—often specialized—jobs in contracting, construction, utilities, manufacturing, and public works.

Both, the John Deere Crawler and the John Deere Wheel-Type, are built around an amazingly efficient, precision-tooled John Deere engine, unmatched for delivering so much, for so long, for so little cost. Both have many construction features of hood, grille, frame, and either wheel or track assemblies that enable them to do more than their share of the day's work of pushing, pulling, lifting, digging, and hauling. Their clean, modern, functional design throughout makes them businesslike in operation, easy to service, and economical to maintain. A line of proved, matched working equipment gives them the versatility that industry demands.

Size up these modern tractors in the light of your requirements. It may be the start of making your power dollars go farther than you thought possible.

Completely Engineered for Industry



The John Deere Crawler is ideal for bulldozing and backfilling.

It's the highly mobile new "440" for use by contractors of all kinds, public utilities, states, counties, municipalities, manufacturing concerns, and many others.

Many optional features, including built-in power steering, add to the versatility of the Wheel-Type.

These tractors make loading and materials-handling fast, easy jobs.

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You can team up your "440" Industrial Tractor with any of the long line of matched and tested working equipment.

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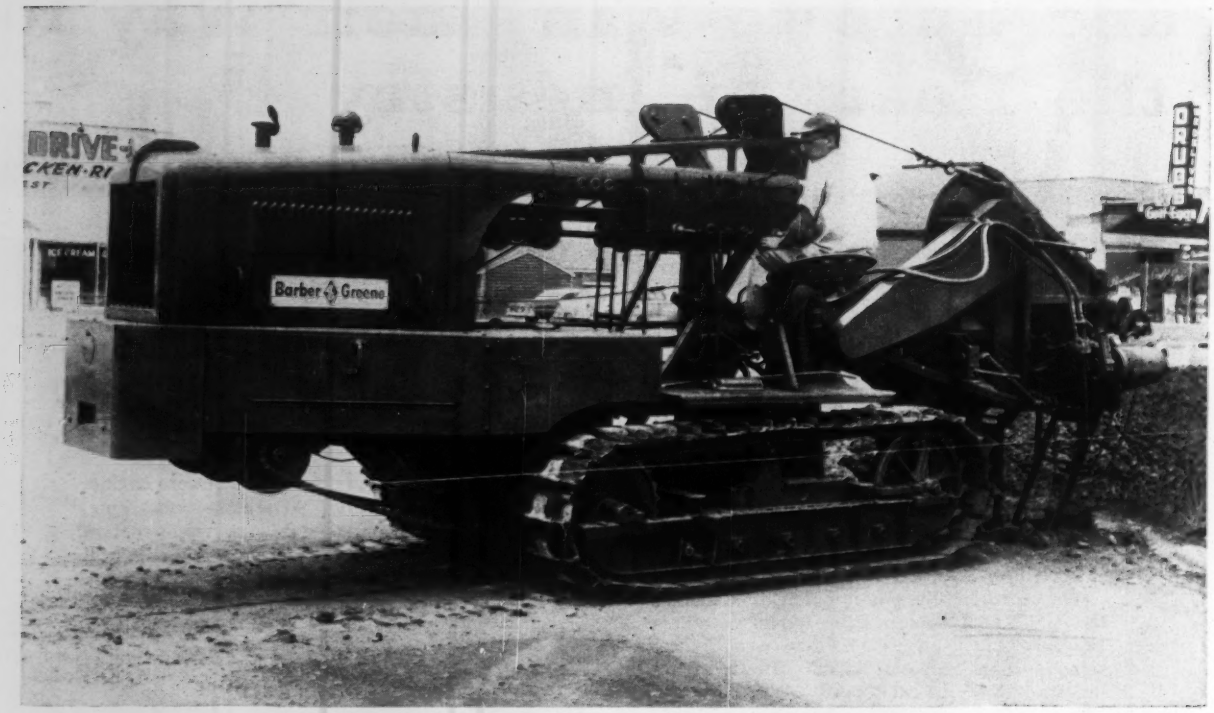

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For city work, and all applications that encounter frequent obstacles, the new Barber-Greene Model 784 is the most advanced ditcher on the market. It combines all the proved vertical boom advantages with revolutionary operational improvements to give *unmatched performance.*

With the exclusive vertical boom, buckets come straight up, producing a trench with vertical ends and no ramps to be dug out by hand. It readily "jumps" sidewalks and underground obstructions. Its fast milling action cuts through toughest materials.

Exclusive dual-range Hydra-Crowd gives maximum digging efficiency at all speeds, makes other ditcher transmissions obsolete. Operator has infinite choice of crowding speeds which can be changed instantly without shifting gears or stopping machine. Instant reverse.

Exclusive hydraulic spoil conveyor gives instant, finger-tip control of belt speed, independent of bucket line speed, for accurate placement of spoil. Instant conveyor reverse.

Revolutionary new features include:

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- New low clearance for easiest transporting.
- New bucket line drive that cuts maintenance and down time.
- New crawlers adjustable in one-tenth the time of conventional crawlers.
- New automatic electric overload protection.
- Readily converted to wheel ditcher in the field.
- New flexible drawbar between chassis and boom.
- New dual-range Hydra-Crowd for maximum digging efficiency.
- New hydraulic spoil conveyor with instant, finger-tip control.

58-1-D

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CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

Reader Comment

Standardization a Virtue?

SIR—I have read with no little interest—and amusement too—Mr. Anderson's article on prestressed beam design (ENR Oct. 17, 1957, p. 326) and the ensuing discussion (ENR Dec. 5, 1957, p. 8). It is all so typical of our American reactions when someone proposes departing from the conventional: Immediately a dozen reasons are advanced why the proposal can't or shouldn't be accepted because it violates standard procedures.

Regardless of all contrary pronouncements, it is quite possible to produce commercially, and in quantity, prestressed beams of Mr. Anderson's cross-sections, and to do it without cracking at the junction of flange and web or having other weaknesses develop in the webs. Mr. Anderson has been doing this very thing in Tacoma for a number of years.

He does it by placing in steel forms no-slump concrete, which, by means of powerful vibrators of extremely high frequency attached to his steel forms, is plasticised and flows freely into place. He produces a concrete which—and I say it advisedly—is of finer quality and greater strength than anything heretofore known in the State of Washington—beams whose webs, less than 24 hours old and without steam curing, can be struck with a hammer and do ring like a bell!

The cracking that has been reported at the junction of web and flange results simply from vertical yielding of concrete against unyielding forms. The trouble is akin to the experiences years ago when columns in buildings were poured integrally with the floor above and cracks developed at the head of the columns. Produce nonshrinking concrete as Mr. Anderson does and there are no cracks; produce something else and the cracks are inevitable. Also, it should not be overlooked that at their ends his beams for several feet are of full rectangular section.

Some European has commented that American engineering generally appears to be characterized by a profligate use of money and materials. It is an observation deserving of consideration. Standardization has many virtues, and heavy cross-sections permit of various shortcomings.

The Bureau of Public Roads, desiring to deal impartially and equitably with 48 different states and to provide for a wide range of conditions, naturally yearns for standard specifications and conservative cross sections. So does the manufacturer accustomed to working with 5,000 psi concrete, but not with 8,000 psi concrete.

Nevertheless, American bridge engineering must somehow learn to accept and accommodate itself to improvements and cross-sections not to be found in the book of rules.

Imagine Freyssinet or Nervi developing under the AASHO specifications!

HOMER M. HADLEY
Consulting Engineer
Seattle, Wash.

Iraq's Problem

SIR—Generally speaking, I like your editorials. I especially liked the trio of January 23, '58 and of these it was the one on economic development in Iraq that prompted this letter.

I fully agree with your sentiments regarding who should benefit from the irrigation project, how they might benefit and why it is important to the Free World that they do profit.

DANIEL HELLER
Research Department
Bache & Co.
Member, New York Stock Exchange
New York, N. Y.

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CALENDAR

American Concrete Institute, annual convention, Morrison Hotel, Chicago, Ill., Feb. 24-27.

American Society of Civil Engineers, Chicago convention, Hotel Sherman, Chicago, Ill., Feb. 24-28.

Building Research Institute, Plastics Study Group meeting, University of Houston, Houston, Tex., Mar. 5-6.

American Concrete Pipe Association, 50th annual convention, Roosevelt Hotel, New Orleans, La., Mar. 9-13.

American Railway Engineering Association, annual meeting, Sherman Hotel, Chicago, Ill., Mar. 11-13.

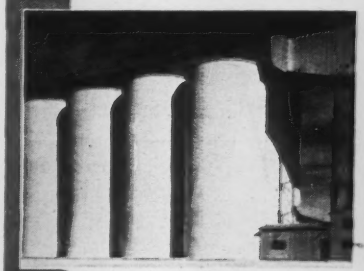
New Jersey Sewage and Industrial Wastes Association, 43rd annual meeting, Traymore Hotel, Atlantic City, N. J., Mar. 12-14.

National Association of Corrosion Engineers, annual conference and exhibition, Civic Auditorium, San Francisco, Calif., Mar. 17-21.

Conference on Light and Vision, University of Michigan, Ann Arbor, Mich., Mar. 19-21.

American Congress on Surveying & Mapping, 18th annual meeting, Shoreham Hotel, Washington, D.C., Mar. 23-26; in conjunction with **American Society of Photogrammetry,** 24th annual meeting, Mar. 26-29.

STOP material waste
REDUCE handling costs
IMPROVE product quality



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storage system

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Let Marietta design and erect an efficient and economical storage system for your needs. Marietta concrete silos are quickly constructed without weather or material delays. Precast solid or lightweight air-cell concrete staves interlock to form an air-tight wall that keeps material stored fresh and dry . . . safe from weather or fire damage.

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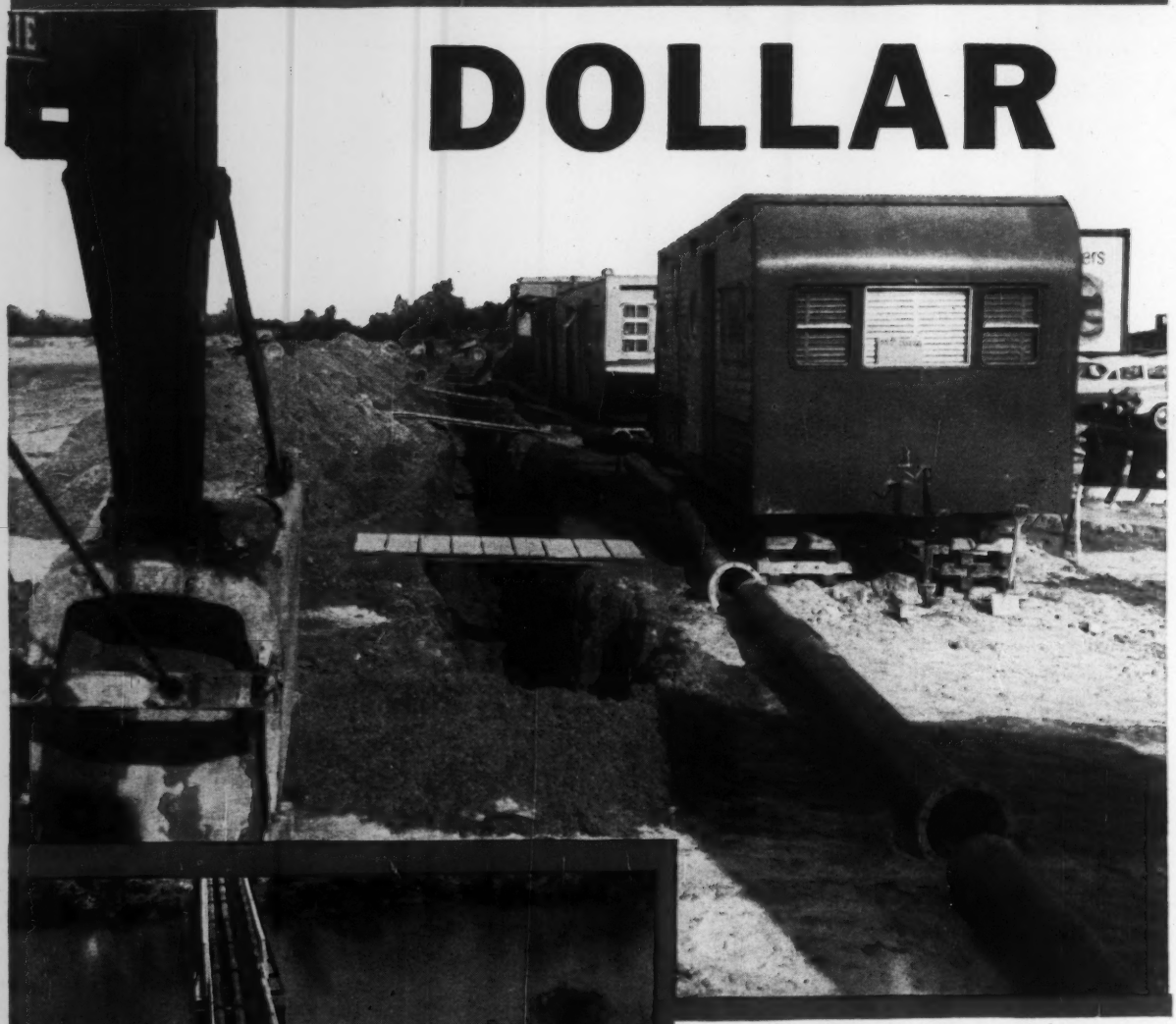
DOLLAR



Ash disposal line for power plant in Alabama, being constructed with 12" Mechanical Joint Cast Iron Pipe.

Big Business, too, chooses Cast Iron Pipe

Fire protection line for large automotive plant in New Jersey, built with Mechanical Joint Cast Iron Pipe.

MODERNIZED **cast iron**

FOR DOLLAR

Cast Iron Pipe delivers MORE water...LONGER!

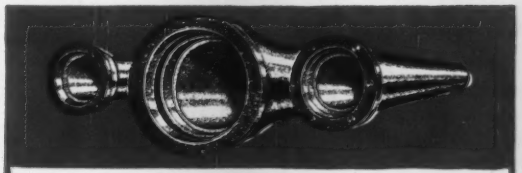
Pipe is a capital investment.

But cast iron pipe is an investment that pays off.

- *In longer life* . . . cast iron pipe serves for centuries.
- *In more efficient operation* . . . cast iron pipe requires little or no maintenance or replacement.

In taxpayer satisfaction . . . cast iron pipe far outlasts the bond issue that paid for it.

Most important to you, these statements are based on proof, not claims . . . performance, not promise. Specify cast iron pipe, America's most dependable pipe, and be sure, not sorry.



6 reasons why Cast Iron Pipe is #1 choice of U. S. A.

1. HIGH FLOW CAPACITY . . .
   Cement lined cast iron pipe and fittings will not tuberculate . . . delivers a full flow for the life of the pipe.
2. LONG LIFE . . .
   42 North American cities are still using cast iron water mains laid 100 years and more ago. Hundreds more have passed the 50 year mark.
3. BEAM STRENGTH . . .
   Cast Iron Pipe is inherently tough . . . stands up under heavy traffic load, soil displacement and disturbance.
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   6" Class 150 Pipe withstands a crushing load of 17,900 pounds per foot . . . nearly 9 tons.
5. CORROSION RESISTANCE . . .
   Cast Iron Pipe effectively resists corrosion . . . vital factor in its long life and dependability.
6. TIGHT JOINTS . . .
   A full range of leak-proof, low cost, easy-to-assemble joints for pipe and fittings are available for all conditions.

THE MAN WHO CHOOSES CAST IRON PIPE TODAY WON'T PAY FOR IT AGAIN TOMORROW!

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Cast Iron Pipe Research Association
Thos. F. Wolfe, Managing Director
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pipe FOR MODERN WATER WORKS

Tru-Stop Brakes

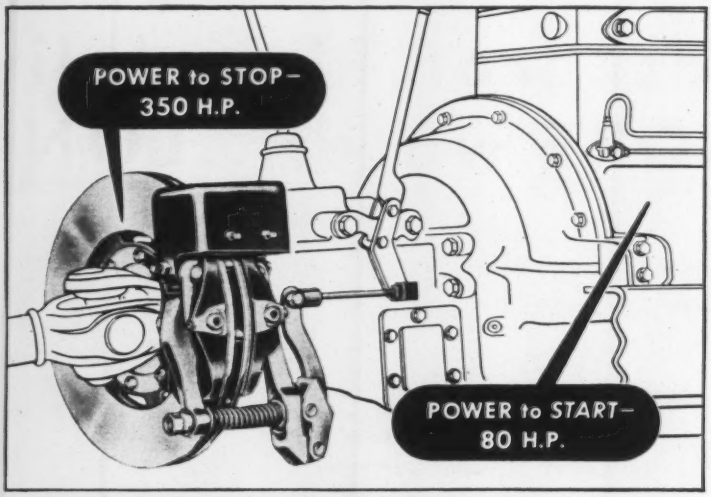
Meet Every Heavy-Duty Safety Requirement

OFFER POSITIVE PROTECTION AGAINST RUNAWAY OR PARKING ACCIDENTS—AT LOWEST COST

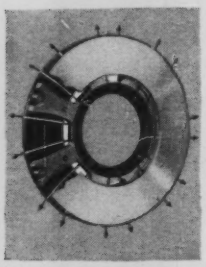
HERE IS WHY:

They have surplus power required for emergency service—no dangerous self-energizing

TRU-STOP Heavy-Duty Emergency Brakes are not only excellent parking brakes. They serve as a complete, independent and fully reliable braking system. Operating on the propeller shaft they enable the driver to continue on safely in the event of service brake failure. TRU-STOP brakes have the surplus braking capacity to be used *repeatedly* as an auxiliary to service brakes.

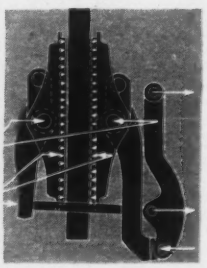


Brakes actually do more work than the engine in terms of horsepower Where it takes 80 HP to accelerate to 20 miles per hour, it takes 350 HP to make a safe stop from 20 miles per hour within required limits



Ventilated to throw off heat

Brake efficiency depends on ability to throw off intense heat—rapidly. Discs of TRU-STOP brakes are exposed to the air even during the braking operation. Ventilated design circulates air *between* the disc plates.



Give uniform brake pressure

Disc of TRU-STOP brakes is "squeezed" between the flat surface of the shoes. Effort applied to brake lever operates front and rear lever arms simultaneously. Pressure is exerted on the center of each shoe. Entire lining surface is in contact.

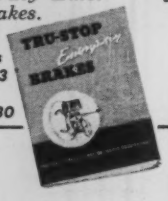
FOR SAFE, ECONOMICAL, HEAVY-DUTY BRAKING WITH MAXIMUM LIFE AND MINIMUM MAINTENANCE

TRU-STOP Brakes are used on a great variety of mobile and stationary equipment

SUCH AS—

- Motor cranes
- Road rollers
- Dump trucks
- Power dividers
- Cooling tower fans
- Oil well pumps
- Cold header presses
- Scrubbing machines
- Wire rope stranders
- Fork lift trucks
- Motor scrapers
- Tractors
- Graders
- Diamond core drills
- Electric locomotives
- Oil well servicing rigs
- Railway inspection cars
- Shapers
- Power take-offs
- Winches
- Motor shovels
- Tractor loaders
- Conveyors
- Hard rock drill positioners
- Mine locomotives
- Power presses
- Railway power ballisters
- Cable tool spudders
- Aerial tram cars
- Tension wire stringers

We will be glad to answer any questions or give you more detailed information about TRU-STOP Heavy Duty Emergency Brakes. Send for Catalogs DH-33 and DH-530



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AMERICAN CHAIN & CABLE

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3. Weekly Service & Inspection Report—an up-to-date record of mechanical condition of equipme work to be done or completed.
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5. "Squawk" Sheet—used by equipment operator to point out trouble spots that need attention.

Tune in "TRACKDOWN" every week, CBS-TV. See your local paper for time and station.

Mobil *Correct Lubrication*

Another reason you're Miles Ahead with Mobil!

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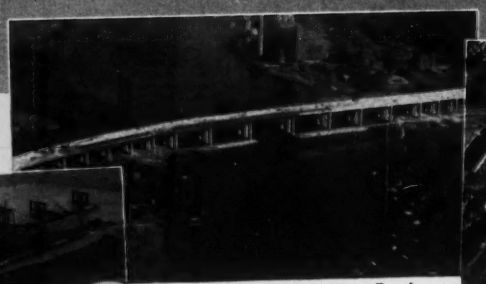
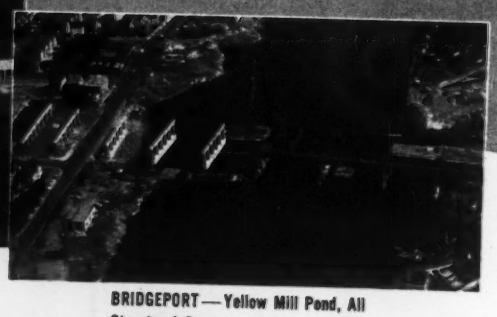


STRATFORD — Housatonic River, Tremie Concrete, Parsons, Brinckerhoff, Hall and Macdonald



BRIDGEPORT — Yellow Mill Pond, All Structural Concrete, E. Lionel Pavio of New York City

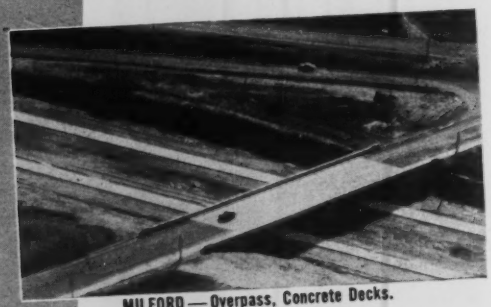
NEW HAVEN — Quinnipiac River, All Structural Concrete, D. B. Steinman of New York City

Better Concrete for Bridges on the CONNECTICUT TURNPIKE with PLASTIMENT®

CONCRETE DENSIFIER

Consulting engineers have specified Plastiment Retarding Densifier on many of the concrete structures along the new Connecticut Turnpike. Their experience has proven that Plastiment adds many structural benefits to concrete — increased uniformity, surface hardness, bond to steel, compressive strength, and reduced cracking. And field men know that Plastiment increases workability enabling placement of low slump mixes. High quality concrete is obtained more readily and more economically through the use of Plastiment.

NORWICH — Shetucket River, Tremie Concrete, John J. Mozzochi & Associates, Glastonbury, Conn. Ammann & Whitney, New York City



MILFORD — Overpass, Concrete Decks. Charles H. Sells of New York City

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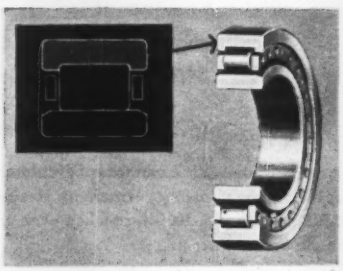
BRIDGEPORT — Viaduct, Concrete Decks. Edwards, Kelcey and Beck of Newark, New Jersey

BRIDGEPORT — Pequonnock River, Tremie Concrete. Ammann & Whitney of New York City

NORWALK — Norwalk River. Tremie Concrete. Frederic R. Harris, Inc. of New York City

AD 26-1

Loggers' "weight-lifter" tests bearing stamina!



TWO-LIP RACE INCREASES RIGIDITY

Two parallel shoulders made integral with the outer race, as shown in gray above, increase rigidity and durability —keep rollers in proper alignment. Precision-ground rollers and races give quieter, smoother operation.

Tossing around logs 6 feet in diameter like toothpicks is no job for a softie! This machine has to be *built* for it right from the start—*right down to the bearings.* And that goes, too, for the trucks which haul these back-breaking giants over the most rugged terrain. Bower tapered and straight roller bearings have been *engineered* for just such work as this—to last longer, perform better under any road or load condition. Painstaking quality control plus basic bearing design refinements—like those shown at left—have reduced Bower Bearing failure to a practical minimum. *Whatever* your product, if it uses bearings, specify Bower! There's a complete line of tapered, straight and journal roller bearings for every field of transportation and industry.

BOWER ROLLER BEARING DIVISION
FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 14, MICHIGAN

BOWER ROLLER BEARINGS

LOCK JOINT ECONOMIES—One of a Series

Low cost operation

Whether it be shining shoes, or a multi-million dollar industry, operational costs can spell the difference between success and failure. That is why so many government agencies, municipalities, private water companies, and industries have turned to LOCK JOINT CONCRETE PRESSURE PIPE.

The dense walls of Lock Joint Concrete Pressure Pipe resist electrolysis and soil corrosion. They also protect steel reinforcing of such conservative stress design that danger of bursting is virtually negligible. Result: replacement or even repair is a rarity, and danger of sudden failure which often entails extensive damage is held to a minimum.

Smooth concrete inner surfaces which cannot tuberculate make the pipe's initial high carrying capacity permanent. Result: low pumping costs and full capacity in the future when even greater demands may be made on the line.

Long life, permanent high carrying capacity and minimal maintenance represent highest quality service at lowest operational cost. This measure of a successful water works system can be yours with LOCK JOINT CONCRETE PRESSURE PIPE.

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Sales Offices: Chicago, Ill. • Columbia, S. C. • Denver, Col. • Detroit, Mich. • Hartford, Conn. • Kansas City, Mo. • Perryman, Md.

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ENGINEERING NEWS-RECORD

Vol. 160, No. 9 February 27, 1958

Number of copies printed this issue, 81,883

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THE CONSTRUCTION WEEK

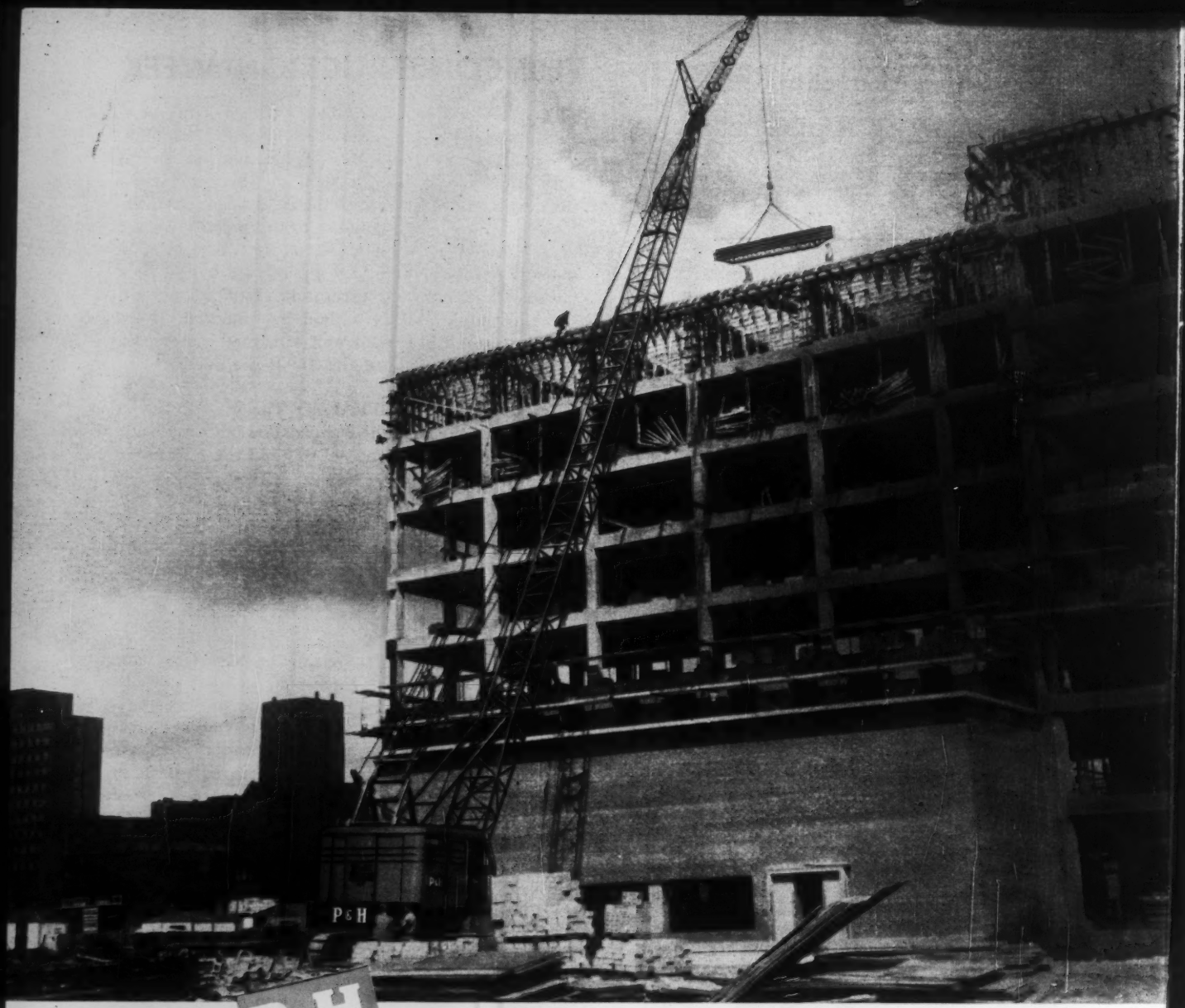
RETRACTABLE ROOF A BARGAIN—To the pleasant surprise of city and county authorities in Pittsburgh, low bids submitted last week on the civic auditorium with the roll-back roof add up to $1½ million less than expected. Low bids on the eight major contracts total $15½ million, in contrast to the prebid estimate of $17 million (ENR Jan. 30, p. 30). Biggest components in the total are $5.9 million, bid by the Dick Corp., Large, Pa., for excavation, foundations and structural work, and $4 million by American Bridge Co., Pittsburgh, for main roof structural steel work, including the framing of the 413 ft dia dome.

FPC DECISION APPEALED—Pacific Northwest Power Co. has asked the Federal Power Commission for a rehearing of its proposal to build the 1.2 million kw Mountain Sheep-Pleasant Valley project on the Snake River. The action lays to rest, for a while at least, rumors that PNPC would ask for a license for the FPC-recommended high dam at Nez Perce. The utility contends its project is best because Nez Perce Dam would possibly destroy the $5 million a year Salmon River fish runs.

PRO STATUS QUO—Members of the New York State Society of Professional Engineers, asked to express themselves on the perennial corporate practice question, have voted 2 to 1 in favor of leaving things as they are. The balloting favored a proposal that the state education law should not be changed to extend the corporate practice of engineering in the area of public practice. Voting followed an inter-society report that set forth two briefs—pro and con—on the question of whether to extend engineering privileges in New York State to engineering corporations barred by the present law.

"IMPRACTICAL" BRIDGE—Three New York State Legislators this week said they will ask Governor Harriman to postpone further action on the proposed Narrows Bridge between Brooklyn and Staten Island until an alternate proposal suggested by a Brooklyn manufacturer can be studied. The alternate calls for construction across upper New York Bay of a $500 million, 2⅛-mile-long structure that would connect Brooklyn and Jersey City, N. J. Austin Tobin, Executive Director of the Port of New York Authority has termed the new plan "uneconomic and impractical."

HIGHWAYS ON DISNEYLAND—The animated hand of Disney Studios, which has dealt with puppets, beavers and African lions among other subjects, is about to produce a film called, "Highways to the Future," for the May 14, 1958, chapter of its television program, Disneyland. The film will trace highways from early water routes, cow paths and Indian trails to today's super highways. It also will project what the nation's highways will be like in 20 years.



"With P&H we saved buggying concrete 2 floors"

At the job-site of an 11-story Chicago hospital, operator Bob Michael was asked about the performance of this rugged P&H 50-ton capacity crawler crane. He said, "After the 7th floor, the boss figured on buggying concrete. We're already pouring on the 9th because this rig's got the speed and lifts higher. I like these big brakes and smooth hydraulic controls. I can 'feel' the load right in—spot quicker—even in 'blind' spots."

Other features Bob Michael likes about the "855" is the P&H planetary boom hoist which raises and lowers the boom under power. It gives him the ¼ inch he needs for real precision work. And with the P&H live roller circle, he can swing right along with the men as they keep their hands on the concrete bucket and pour.

For high and heavy lifting, no other machine in the 50-ton class can match the workable capacity, speed, stability and accuracy of the P&H 855B-LC with long crawlers. That's why when owners and operators get together they agree on P&H!

SAYS Bob Michael, operator of 50-ton P&H 855B-LC.

HARNISCHFEGER

Construction & Mining Division
Milwaukee 46, Wisconsin

WASHINGTON OBSERVER

- **British to build U. S. missile bases in U. K.**
- **White House readies public works lists**
- **Spending ceiling still holds**

● **Construction of the four intermediate range ballistic missile bases to be built in Britain** will be handled by the British themselves. Under an agreement signed this week, the U. S. will pay for and supply the missiles and ground-support equipment. The British will "provide the sites and supporting facilities for (their) deployment."

Total construction costs are estimated at close to $90 million by Washington insiders. But Prime Minister Macmillan says the British share of the costs will total about $28 million, which presumably covers the brick-and-mortar work.

Construction contracts for conversion of RAF bases into missile facilities will go to British firms, according to Washington sources. They'll be working from U. S. Air Force specs for reinforced concrete blockhouses, launching pads, and other base facilities (see pp 22, 30).

—

● **General Bragdon, White House Public Works Coordinator, gave a brushoff to congressmen seeking Administration anti-recession plans.** His answer to Chairman Wright Patman of the Joint Economic Committee was: "It is not proper for me to discuss staff studies" being carried out at the direction of the President. He did agree, however, that a big step-up in public works spending is possible "quickly if funds are made available."

The general is expected to have a public works list ready for President Eisenhower within a matter of days. No one knows now whether any list of projects available for increased spending will be released before the President decides whether to recommend increased spending to Congress.

Corps of Engineers, Bureau of Reclamation and other agencies have been submitting information on their own situation. These reports are being reviewed by the Public Works Coordinator for (1) those projects that could be advertised for bids immediately and (2) those that are not quite this far along, but could be brought to the bid stage in a reasonable lengh of time.

In addition, General Bragdon's people are quietly preparing such lists to be recommended next fall, a year from now and even later—in case the recession doesn't end this spring and summer as the Administration hopes.

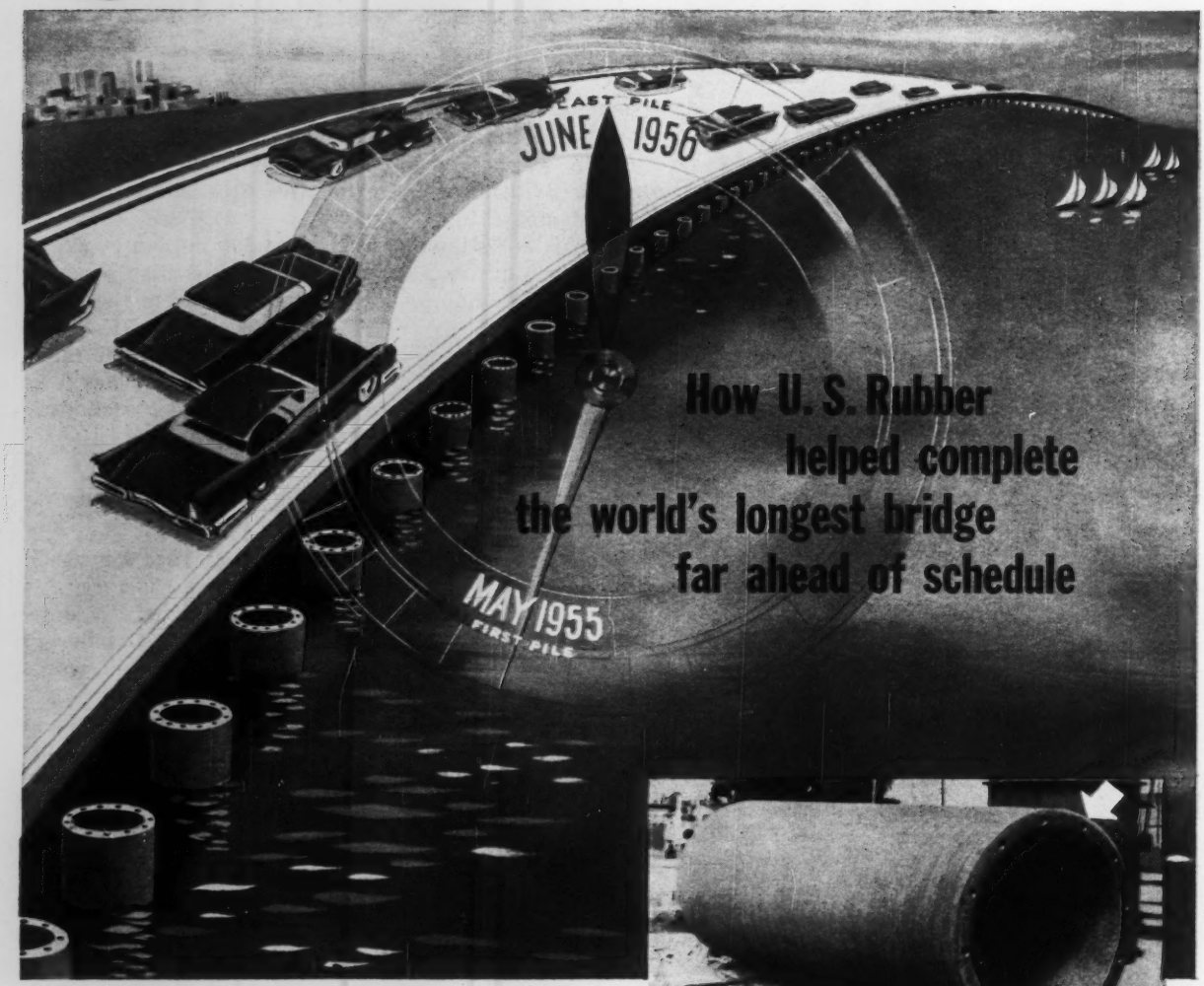
Latest available Administration figures indicate around $2 billion of federal public works alone that are at the contract-letting stage. The Administration is reluctant to step quickly into a big public works drive; but the Democrats in Congress are trying hard to force the issue.

Senate public works chairman Chavez has already come up with a plan to spend an additional $1.3 billion on public works for the year beginning next July 1.

—

● **The Administration as of this week is still holding down the rate of spending on going public works construction projects**—despite all the political hullabaloo over the need for increased public works programs as an anti-recession measure. The rule still in effect is the one handed down when the "freeze" on new contracts was lifted several weeks ago. This means field offices of the Corps of Engineers are still operating under orders that hold construction operations to a minimum rate, and to award no large contracts unless they are absolutely essential to continuation of work.

US RUBBER ENGINEERED RUBBER PRODUCTS

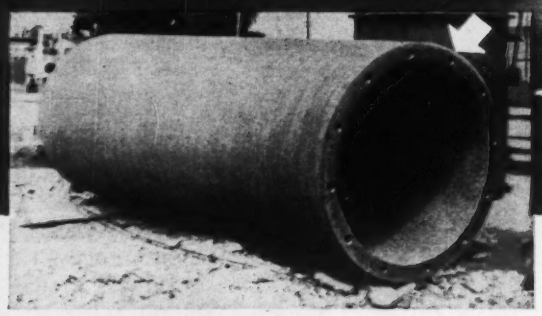


How U. S. Rubber helped complete the world's longest bridge far ahead of schedule

The Lake Pontchartrain Causeway at New Orleans is 24 miles long! That's a lot of bridge over the water. Using special assembly-line construction methods, the contractor turned out the job in one-fourth the time it would've taken had ordinary construction methods been followed.

U.S. Rubber's special #4830 Rubber Tubing was one of the big reasons why this gigantic project was completed so quickly. With this tubing, it was possible to prefabricate, in sections, the almost 8 miles of cylindrical concrete piling that supports the bridge. Here's how they did it:

The U.S. Rubber Tubing—75,000 feet of it—was used to pre-form round channels in the pile sections when they were cast. When the concrete hardened, the tubing was removed. Then the sections—usually six—were joined to make a single pile and high-tensile stressing wires were inserted through the channels. Naturally, the rubber tubing had to hold exacting tolerances as the concrete set so that the channels' diameters would always be precisely uniform for the entire length of the finished pile. And the tubing had to be strong, easy to handle, and abrasion resistant in order to be used over and over again.



54" o.d. section of finished pile showing precise round channels formed by U.S. Rubber Tubing. There are 12 of these cores in every section. Each core has a diameter of 1.375 inches.

There are many construction jobs right now where U.S. Engineered Rubber Products are helping to make shortcuts. For complete information and expert engineering assistance, contact us at Rockefeller Center, New York 20, N. Y.

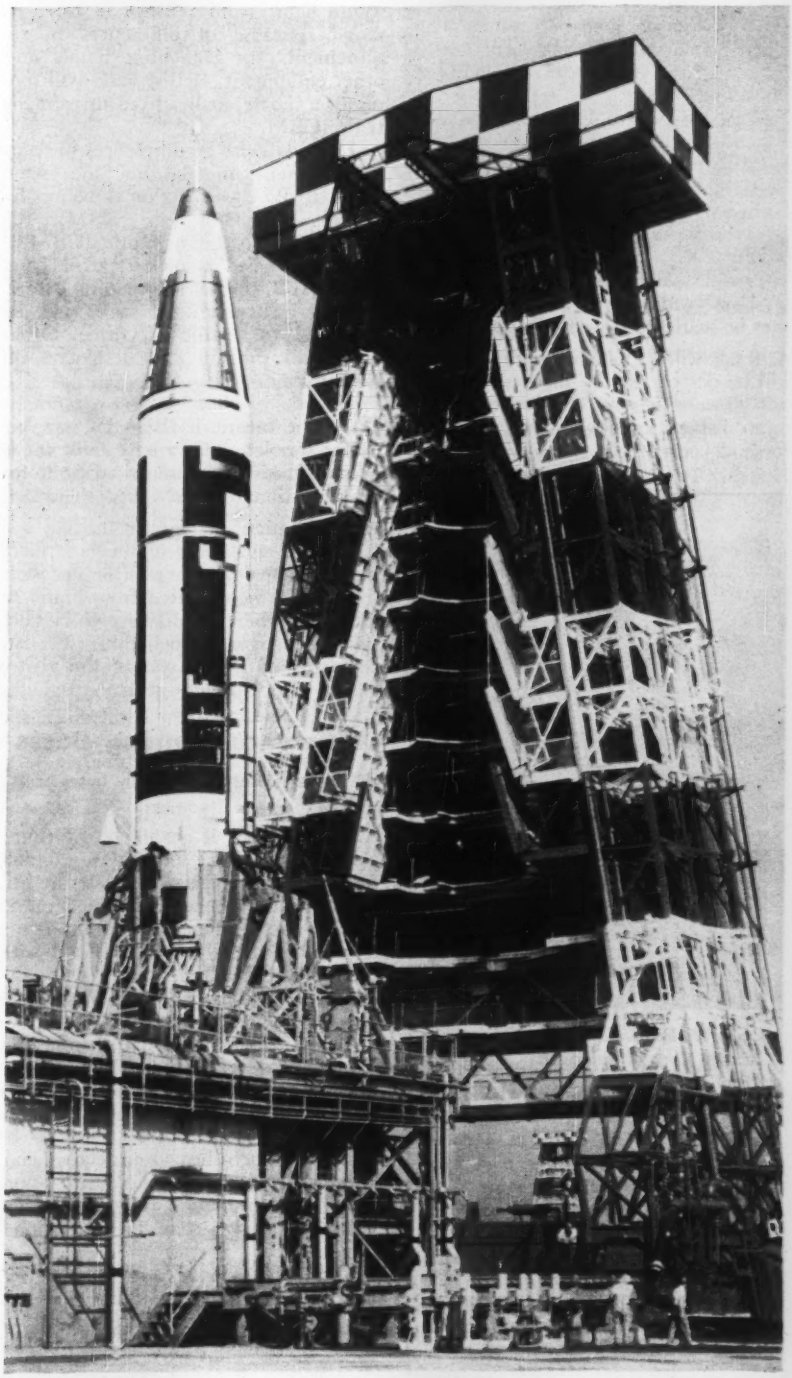
US RUBBER

Mechanical Goods Division

United States Rubber

See things you never saw before. Visit U.S. Rubber's New Exhibit Hall, Rockefeller Center, N.Y.

Now—Millions for Missile Bases



GANTRY TOWER puts Atlas ICBM on launching pad at Cape Canaveral, Fla.

The construction end of the burgeoning guided missile program is going into high gear.

Military contract awards for missile-related construction will total at least $750 million in fiscal 1959, starting next July 1, according to Pentagon estimates obtained by ENGINEERING NEWS-RECORD. The Air Force accounts for the largest share of the projects, with the Army Engineer Corps acting as major contracting agency.

Construction makes up roughly 15% of the over-all $5.3 billion missile program. In the current fiscal year, construction accounts for at least $300 million of a total missile program costing $4.3 billion.

The bulk of next year's money is earmarked for construction of operational bases—domestic launching sites for intercontinental ballistic missiles; overseas sites for intermediate-range ballistic missiles; air defense bases employing Nike-Hercules, Talos and other anti-aircraft missiles; and ballistic missile detection and tracking sites.

Next year, missile-related work will make up well over 40% of total military construction contract awards. During fiscal 1958, ending next June 30, only about 15% of the over-all military construction program has been devoted to missile facilities.

The major projects to be pushed:

- An ICBM training and operational base at Cooke Air Force Base, Lompoc, Calif., to cost at least $100 million when completed (see p. 30). The base will also contain launching pads for training of IRBM squadrons.
- An operational ICBM base at Warren Air Force Base, Cheyenne, Wyo. The base is expected to cost $65 million when completed.
- A third ICBM launching site—the location still undetermined.
- Three ballistic missile detection sites in Canada to tie into the DEW line. Site location surveys are already under way.
- Construction of three $6 million facilities for extending the SAGE air defense control system.

To learn what's in store for engineers and contractors in design and construction of Air Force missile bases, ENR visited the AF Research and Development Command, Ballistic Missiles Division, in Inglewood, Calif.

(*Continued on page 22*)

(Story starts on p. 21)

What's in the Missile Program for A-E's

Q. Colonel Leonhard, can you start us off with a brief rundown on missile facility work past, present and future?

A. Well, the first requirement for a missile program is a group of manufacturers capable of producing hardware, with adequate production facilities, and with test facilities for use in the research and development stage. That's where our construction money has gone to date. During the past three years—since the program was accelerated—there has been nearly $500 million invested in construction of production and testing facilities for the Air Force ballistic missile program. Something over $100 million of this was the manufacturers' own financing, and the rest was Air Force money. Much of this building was at manufacturers' plants, or near them, but the figure also includes facilities at three test centers—Edwards in California, Holloman in New Mexico and Patrick in Florida.

This kind of expenditure is now mostly behind us. We have a production base to turn out the missiles, and in-place test facilities to check them out. Now our major interest and resources will go into operational facilities.

The first base in the operational concept is Cooke Air Force Base, which is under construction now. Actually, this is a combined training and operational ICBM base. We have announced plans for Warren Air Force Base in the vicinity of Cheyenne, Wyo., and expect to begin construction there within this fiscal year. As you know, the President mentioned a third base in his budget message, and there are other sites under consideration.

The operational bases in the U.S. will be, of course, ICBM bases. How many there will eventually be I can't tell you, both for security reasons and because our plans are still developing. Outside the U.S., the bases will be IRBM bases. Quantity and location of these will depend on many factors, including, of course, the views of our allies.

Missile Facilities

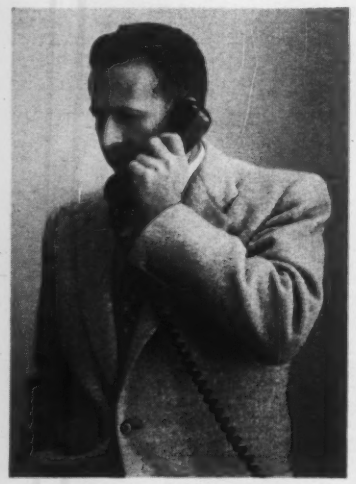
Q. What does a missile base consist of?

A. It's a special type of animal. When you think of missile bases, you have to get away from the idea of a single contiguous piece of property—a parcel of real estate with a fence around it. The "base" proper may be just a place to put your shoes—with the actual launching sites at widely separated locations in its vicinity. This will be the case, for example, at Warren. The base the Air Force has acquired from the Army will be a "support base", chiefly for personnel, supply and administrative functions. It may or may not have missile check-out and repair facilities. The actual work with missiles will be at launching sites scattered in the Cheyenne vicinity.

Each site will be a sizable installation, with launch stands, equipment for propellant storage and loading, launch control stations, guidance control stations, a power plant, a water pumping plant and perhaps a missile assembly building.

Q. How widely will these launching sites be scattered from the support base?

A. That will vary. Minimum distances will be determined by the desire not to put all your eggs in one basket. Maximum distance by how far you're willing to send your people out to work.



Col. William E. Leonhard . . .

. . . is assistant for installations to Maj. Gen. B. A. Schriever who heads up Air Force missile research and development. In his key post, Colonel Leonhard is primarily concerned with base construction. He is a Penn State graduate with MS degrees from MIT in civil and electrical engineering. In and after World War II he was with the Corps of Engineers, one of his postwar responsibilities being that of director of installations for the Air Corps in Weisbaden, Germany.

Q. Do different types of missiles require different types of bases?

A. They do, indeed. There will be very great differences between ICBM bases and IRBM bases—much more than you would figure from a factor of three in range. Because of differences in requirements for launching stands and other equipment, IRBM bases will represent a much smaller fixed investment than ICBM.

There will also be differences in bases for different missiles of the same range. BMD is working on three missile systems—the Thor (an IRBM), the Atlas and the Titan (both ICBM's). Each will have its own type of base. Cooke AFB, since it is a training base as well as an operational base, will be equipped to handle all three. Other bases will probably be designed and built for just one missile.

Q. In the future, if the Atlas, say, becomes obsolete, will a base built for it need extensive revision to adapt it for other missiles systems?

A. Even minor changes in missiles will take some revamping of the base facilities. For major changes (for instance, if the Atlas were shifted from liquid to solid fuel) there would have to be substantial changes, in such things as characteristics of launch stands, the gantry cranes, tanks, piping—general spaghetti.

Differences Among Bases

Q. Is the pattern for missile bases pretty well set?

A. No, indeed. It is an evolving thing. We're constantly looking for better ways of getting these birds in the air. We consider Cooke a training ground for our architect-engineer firms. It's a chance for them to get into bed with the associated manufacturers who produce the missiles, gain knowledge that can be applied to future bases.

Cooke varies substantially from test sites. Space requirements per launching site are less, for instance—chiefly because there's not so much instrumentation. And there doesn't have to be quite so much heavy protective construction. Naturally there are more unknowns, and more risks, in the development stages than the operational stages.

Phase II at Cooke, and Warren, will be different from the initial phase of work at Cooke. Installations will be less sophisticated and still less massive. We're finding it's possible to do as good a job, or better, without such an

and Builders

extensive outlay of brick and mortar, concrete and steel, as we thought necessary.

There are other variations under study. We're looking into "hardening up"—perhaps going underground. Not for the sake of hiding—hiding is kidding ourselves—but for protection. If we do go underground, costs will go up.

And then, of course, development work on missiles goes on. The three weapons systems currently in advanced development—the Atlas, Thor, and Titan—make a tree on which you can hang additional branches. We'll undoubtedly in time have other missiles with other requirements for which to plan.

Q. Will each missile base need an aircraft runway?

A. A runway won't be a necessity—but lack of it would certainly be an inconvenience. There'll be much air transport involved with operational missiles—of the missiles themselves, of spare parts, of personnel. We won't build a runway at Warren, not because we don't want one, but because there's a field close enough to serve.

Q. How many men will be stationed at a missile base?

A. It will vary. There will have to be a crew of several dozen men per missile in a ready status at the launching sites at all times. And, of course, support functions will have large personnel requirements. A missile wing, such as will be based at Warren, will consist of several squadrons and will total several thousand men. As missiles are further developed, they may require twice as many men as now—or half as many.

Q. Will you build family housing at missile bases as well as barracks?

A. Definitely. There will be a Capehart housing at Cooke, for instance, and we think it will be the best in the service. All homes will be three or four bedroom, with two baths, dishwashers and other built-in appliances.

$100 Million Per Base

Q. What will a missile base cost?

A. The expenditure at Cooke will run around $100 million. Warren about the same. At Warren we will have to do very little building on the support base itself, since it was the second largest Army installation in the country prior to World War II.

COL. WILLIAM E. LEONHARD—interviewed by ENR at headquarters of the Air Force Research and Development Command, Ballistic Missiles Division—answered the construction industry's questions about missiles and missile base construction.

Q. What about overseas bases?

A. I wouldn't want to estimate. Requirements and local costs will vary tremendously. As I've said, IRBM bases will cost substantially less than bases for the ICBM.

Q. Will all Air Force missile base construction work be under control of your office?

A. Initially, yes. As you know, most Air Force facility design and construction is performed either by the Corps of Engineers or the Bureau of Yards and Docks. Ballistic Missiles Division has authority from the office of the Secretary of Defense to do its own design and construction. In practice, we handle the design of missiles facilities and utilize the Corps of Engineers to supervise construction as well as to design support facilities such as barracks and runways.

The actual reasoning behind this arrangement is this: Because of the changing, complex technology of missiles and the complex requirements placed on the launching sites by the nature of the missiles, it's thought best to have missile development and base design under one management. There are 17 major prime contractors—I'm speaking of manufacturers, not construction contractors—involved with the development and production of our three weapon systems, along with innumerable subcontractors. Coordination between these and the facility designers is highly important.

Under the special circumstances of this program, it would be difficult to work efficiently with A-E's through a third party.

A-E's and Constructors

Q. What do you require of A-E firms to participate in the program?

A. Besides the usual, we have the special requirement of familiarity with weapons effects phenomena—heat, radiation, earth shock, transient and permanent displacements, blast effects—everything associated with kiloton and megaton yield weapons.

At present we have contracts with these design firms: Holmes & Narver for Atlas facilities; Daniel, Mann, Johnson & Mendenhall for operational sites for the Thor; and Ralph M. Parsons for design work on some interesting projects we have in another theater. We have briefed about 26 firms on our Titan requirements, and expect a dozen proposals to do work for us.

(EDITOR'S NOTE: At publication time Daniel, Mann, Johnson & Mendenhall had been selected. They will work in joint venture with Rust Engineering and Mason & Hanger-Silas Mason, Inc.)

Q. What about construction firms?

A. We'll lay special stress on a satisfactory record in labor relations and unquestionable financial capacity. That's partly the result of our experience at Patrick, where we've been plagued from the start by strikes, and where a major contractor defaulted. Another important thing we must be assured of is that the contractor has sufficient flexibility to accept changes during construction. So far, all construction has been on a bid basis.

(EDITOR'S NOTE: For the kind of firm doing missile base work, see Men and Jobs, p. 49).

Vast Soviet Water Effort Evaluated

In testimony before Senate Interior and Public Works Committees last week, Maj. Gen. E. C. Itschner, Army Corps of Engineers Chief, presented the most comprehensive picture of Russian accomplishments and plans in the water resources field to date.

Although the Soviet effort was favorably compared item for item to U.S. work in his statement, General Itschner did admit that the U.S. economic and industrial system is in a different stage of development, is growing along different lines and doubtless has different needs. However, the Corps Chief held that the evidences of Russian technical capability and vast accomplishment in the water resources field should help the U.S. understand the tremendous effort the Soviets are throwing into their economic competition with us.

• **Overall summary**—Noting that the Soviets have given water resource development a priority second only to development of heavy industry, General Itschner summarized the U.S.-Russian "race" as it stands today:

• In hydro power, the Russians approach the U.S. in total installed capacity and have individual projects under way that far exceed any American project (see table).

• In inland navigation, Russian projects rival those in the U.S. in scope but traffic is less than on American waterways.

• In irrigation, Soviet efforts are comparable to the U.S. in scope and rate of added new acres.

• In flood control, water supply and recreation, Russian projects do not equal American but they do not appear to need them at this time.

• Soviet power equipment is excellent and, indeed, superior to American equipment in a few respects.

• **Engineering skill**—Most Soviet water resource projects are multipurpose, but the hydroelectric function receives emphasis and priority. Russian demands for building materials, especially concrete, are great. Consequently, Soviets lean toward construction of large earth and rockfill dams.

Maj. Gen. E. C. Itschner

Most major Soviet rivers flow through generally flat terrain so there are few gorge damsites. Project sites often consist of a high bluff on one riverbank and a wide flat flood plain on the opposite bank. Seasonal variations in flow are great, requiring large reservoirs. Hence, the Russians have had to develop engineering techniques for long, high earth dams. At least four of these are between 7 and 13 miles long.

Wintry climate required the Soviets to devise techniques of placing concrete in cold weather that General Itschner said exhibited marked ingenuity. Their engineers also have had considerable difficulty with foundation conditions.

In all, the Chief of Engineers said Soviet technology has proven itself completely adequate to meet the Russians' peculiar technical problems. He noted that the 370-ft-high Krasnoyarsk Dam will include a vertical ship elevator to deposit vessels in a metal trough and thence into the reservoir.

• **Scope of accomplishment**—The total known capacity of Soviet hydro plants complete or under construction is 25.9 million kw, compared to U.S. completeted capacity of 27.7 million kw with another 10 million kw under way. But the Russian rate of construction is higher; 2 million kw were completed in 1956.

Because of sparse development of flood plains, the Soviets can build larger reservoirs for power purposes that also serve for navigation. Therefore, there is relatively little canalizing of rivers with purely navigational pools.

On the Volga, 12 power dams, eight of which are complete or under way, will provide 10 ft minimum depth over 2,000 miles of stream. On the Dneiper, five dams, all under way, will provide 680 miles of 10 ft depth on the mainstem and eight more dams, one started, will provide 1,600 navigable miles on tributaries. In the Ob Basin there are to be 4,300 navigable miles, and in the Yenesey 2,400 miles; only a few of the power dams are under way.

In 1956, Russian inland waterway traffic totaled 48 billion ton-miles, compared to 220 in the U.S. Tonnage in the USSR increased 60% between 1950 and 1956, while U.S. tonnage jumped 30% during this period.

Soviet claims for irrigation are less well supported than power and navigation, according to General Itschner. Between 1951 and 1955, the area under irrigation in Russia appears to have increased by 6 million acres, or 25%, compared to an increase in the U.S. of 5.5 million acres, or 21.6%. However, the General sees the Soviet rate accelerating for it is Russian practice to bring irrigation portions of multipurpose projects along more slowly than other functions.

In conclusion, General Itschner stated it is apparent the Russians are relying fundamentally on water resources development to build up their economic capability, and that this buildup is aimed squarely at worldwide economic competition with the U.S.

How Largest U. S. and Russian Hydro Compare

		Powerplant		Reservoir	Dam			
U.S.A.								
Name	River	Capacity (kw)	Turbines (no.)	Capacity (acre-ft)	Type	Length (ft)	Max. Hgt. (ft)	Status
Grand Coulee	Columbia	1,944,000	18	9,402,000	Concrete; gravity	4,173	555	Completed 1942
Hoover	Colorado	1,249,800	18	29,827,000	Concrete; arched gravity	1,244	726	Completed 1936
Lewiston	Niagara	1,950,000	13	.....	.....	.....	...	Under constr.
Tuscarora	Niagara	240,000	12	.....	.....	.....	...	Under constr.
U.S.S.R.								
Krasnoyarsk	Yenisey	4,004,000	14	85,790,000	Concrete; probably gravity	2,300	400	Under constr.
Bratsk	Angara	3,840,000	18	145,100,000	Concrete; gravity	2,000	444	Under constr.
Stalingrad	Volga	2,300,000	22	89,200,000	Earth	16,400	120	Under constr.
Kuybyshev	Volga	2,100,000	20	42,400,000	Earth	19,140	100	Completed 1957

Week-Long Landslide

Massive landslide engulfed road, threatened river

A massive landslide—which moved at the rate of 10 to 15 ft a day for a week before stopping—swept over a 1,000 ft long section of U. S. Highway 6-24, 23 miles east of Grand Junction, Colo. With the highway paralleling the Colorado River, it took 30 men and 16 pieces of heavy equipment working around the clock to keep the earth mass from damming the river.

The depth of the slide at a center "hump" was nearly 23 ft over the road, while most of the depths along the 1,000 ft width of the slide ranged from 10 to 15 ft. Men and machines worked more than a week to clear the slide from the road and the bed of the river at a cost of $3,000 a day, according to Ralph McCoy, district engineer for the Colorado Highway Department. He said that the slide probably was caused by underground water seepage that softened a layer of clay at an undetermined depth. Residents of the area noted that there was a similar slide in the same place in 1916.

Some of the cost of removing the slide will be salvaged, said Mr. McCoy, since half of the mass can be used as fill for widening the roadbed to interstate highway specifications, a project that was already in progress on the road.

Folsom Dam Legal Action Is Settled Out of Court

Winston Brothers Co. and Al Johnson Construction Co. have reached an agreement with Merritt-Chapman & Scott Corp. in mid-trial of a $275,000 damage action by Winston-Johnson over cofferdam washouts during construction of Folsom Dam on the American River near Sacramento, Calif., in 1953. Amount of the settlement has not been disclosed.

The settlement came after a week of testimony in Superior Court at Sacramento. It was the second time the case had gone to trial. In the first trial a year ago, a jury said Winston-Johnson was not entitled to damages.

Late Superior Court Judge Grover W. Bedeau, who had presided at the first trial, granted a new trial, mainly because he considered the jury's verdict not to be justified on the basis of the evidence.

The cofferdam washouts were at the Merritt-Chapman & Scott operations at the Folsom Dam site, which the New York firm was building for the Corps of Engineers.

The rush of water that swept down the American River flooded the Winston-Johnson facilities at Nimbus Dam, a Folsom afterbay dam being built by Winston-Johnson for the Bureau of Reclamation. Winston-Johnson blamed the two washouts, occurring at different times, to negligence on the part of Merritt-Chapman & Scott.

U. S. to Spend $20 Million At Alaskan Defense Sites

This year the government will pay $20 million for defense construction at remote Alaskan sites.

Air Force construction will total $18.7 million. Most of this is tabbed for "Operation Stretchout." This long-term Aleutian Islands project is designed to extend westward the upper boundary of the present DEW-line (distant early warning).

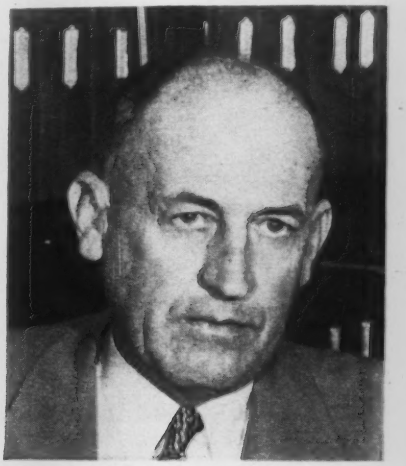
Total long-term cost of "stretchout" is $25 million, for which initial contracts were let early last year. This year's work will approach $15 million.

Other Air Force work planned for remote sites this year includes modification jobs at 10 combination aircraft-and-warning sites at a cost of $2.8 million, and smaller projects.

Army remote-site construction this year will cost $771,000. Biggest project planned for the Army is construction of family quarters on the Haines-Fairbanks pipeline. Cost of this job is about $500,000.

Colonel P. V. Kieffer, Jr., Alaska District Engineer, says final plans for next year's program are still tentative. Individual projects will be advertised for competitive bids over the next several months, as final design work is completed and approved.

Leslie N. McClellan



Grant Bloodgood

McClellan Retires From Reclamation Bureau

Leslie N. McClellan, the Bureau of Reclamation's noted chief engineer in Denver, retires tomorrow after 46 years of distinguished federal service. He is succeeded by Grant Bloodgood, now associate chief engineer in Denver.

Meanwhile, in Washington, the assistant commissioner for administration post vacated recently by the retired Stanley R. Crosthwait was filled this week by Alfred R. Golze, former chief of the division of program coordination and finance.

Mr. McClellan is carrying out an old dream of setting up a private consulting practice and has the bureau as his first client. Interior Secretary Fred Seaton acclaimed his accomplishments as having "gained world wide recognition." Most of the bureau's major dams and power plants—including Grand Coulee, Hoover and Shasta—were designed under Mr. McClellan's direction.

An electrical engineer, Mr. McClellan became chief engineer of the bureau's Design and Construction Division in 1948 and assistant commissioner and chief engineer in 1953.

His successor, Grant Bloodgood, has served with Reclamation since 1920. He was chief construction engineer of the bureau from 1948 until 1954 when he moved into the newly created post of associate chief engineer. Edwin G. Nielsen, assistant commissioner for irrigation and power, leaves Washington to take over Mr. Bloodgood's former duties. Mr. Nielsen is a former director of Region 3 in Boulder City, Nev.

The new assistant commissioner in Washington, Alfred Golze, has been an engineer with Reclamation for 23 years. As director of programs and finance, he modernized bureau accounting operations and strengthened budget procedures to support Reclamation's heavy construction program.

Effect of A-Power Wastes On Coastal Waters Studied

The U. S. Coast & Geodetic Survey last week began measuring the movement of harbor waters along the Atlantic Coast to determine possible effects of radioactive wastes from nuclear ships and ocean dumping.

To be measured are speed of currents and rate of salt-fresh water exchange. So while the project's primary objective is to aid long-range nuclear planning, the data also will be of considerable service to pollution control officials.

New York harbor is the first to be surveyed, with checks scheduled at a later date for Delaware Bay and Chesapeake Bay.

To measure current, CGS will suspend flow meters from buoys spaced across a channel. Flows will be registered at various depths between surface and channel bottom over a 100 hour period at each station. Temperature and salinity of the water, which furnish indications of how fast fresh mixes with salt water, will also be measured.

The study is being financed by the Atomic Energy Commission and the Maritime Administration.

The Chesapeake Bay Institute of the Johns Hopkins University will compile and evaluate the oceanographic data obtained.

Corps Studies New High Dam in Columbia Basin

The Corps of Engineers has started a study of a high dam project on the Flathead River in western Montana as a possible alternative to the proposed $481 million Paradise Dam on the Clark Fork River.

The newly proposed project site is near Knowles, Mont., on the Flathead River about 3 miles above its confluence with the Clark Fork River and 7 miles above the Paradise site.

Col. Allen F. Clark, North Pacific Division Engineer, said preliminary studies indicated cost of the Knowles project would be substantially less than the estimate for the Paradise project, due primarily to greatly reduced relocation requirements.

Relocation costs for Paradise Dam would amount to $316 million of the estimated $481 million cost, involving moving of 77 miles of mainline railroad, 14 miles of primary highway and of an estimated population of 2,500.

Preliminary studies indicate Knowles would store about 3 million acre-ft of water as compared to 4 million acre-ft for Paradise, and have an initial installation of 276,000 kw compared with 432,000 kw at Paradise.

Both the Knowles and Paradise projects would flood out the Buffalo Rapids damsite on the Flathead River. Montana Power Co. has stated it wants to build the $80 million Buffalo Rapids project.

Barrier Proposed Across Delaware for Water Supply

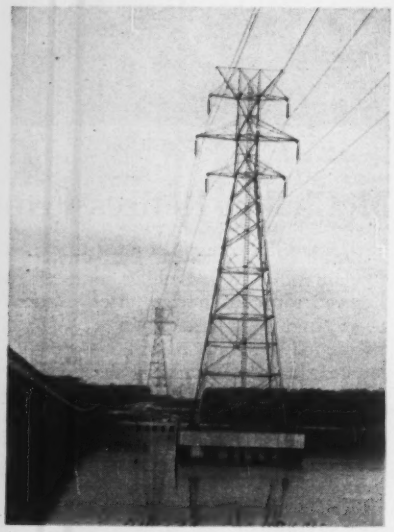
A tidal barrier across the lower Delaware River has been proposed to provide northern Delaware with a fresh water supply to meet needs of the next 100 years.

The dam, reminiscent of a once-proposed Hudson River barrage (ENR Feb. 23, 1950, p. 29), would be located just below New Castle.

The proposal was made by Norman M. Lack, Delaware's representative on the four-state Delaware River Basin Advisory Committee, to state officials.

The dam would be a hydraulic earthfill equipped with two locks. It would cost about $50 million. By halting salt-water intrusion, it would impound about 275 billion gal of fresh water.

Prior to Mr. Lack's proposal, the Corps of Engineers had not included any sort of tidal barrier in its current comprehensive study of the entire Delaware Basin. However, Col. William F. Powers, Philadelphia District Engineer, said feasibility of the proposed structure would now be investigated.



H-Piles Simplify Crossing

Power transmission towers 129 ft high and spaced 770 ft apart are supported on steel H-piles to cross half-mile-wide Casco Bay near Yarmouth, Me. The piers have a 5-ft-thick concrete cap resting on 75-ft-deep steel H-piles. The 5 mile, 115 kv line was designed by Blaw Knox Co., Pittsburgh, for Central Maine Power Co.

Pittsburgh-Lakes Canal Called Uneconomical now

Construction of a canal between Pittsburgh and Lake Erie is not practical at this time, according to Ford, Bacon & Davis, New York City engineering firm which conducted a survey of possible canal routes for the Pennsylvania State Planning Board.

The project was not recommended because overall savings in transportation costs fail to equal the annual charges on the increased public debt.

A canal along the Beaver-Mahoning Rivers route, previously recommended by the Army Engineers, would cost $1.1 billion. Annual carrying charges of $54.8 million would exceed by far the estimated saving of about $39 million on a potential traffic estimated at 41 million net tons.

An alternate route along the Allegheny River and French Creek also would be uneconomical, the report stated. Charges would exceed the saving in transportation costs by $19.6 million annually.

Water Resources Team Urged for Wabash Valley

Creation of a Wabash Valley research, planning and engineering agency to study flood control, water supply, navigation, stream pollution control projects and flood plain use and zoning has been recommended by an inter-university planning committee.

Composed of faculty members of the Universities of Illinois, Purdue and Indiana, the committee has been studying the potential of the Wabash River which forms much of the boundary between Illinois and Indiana.

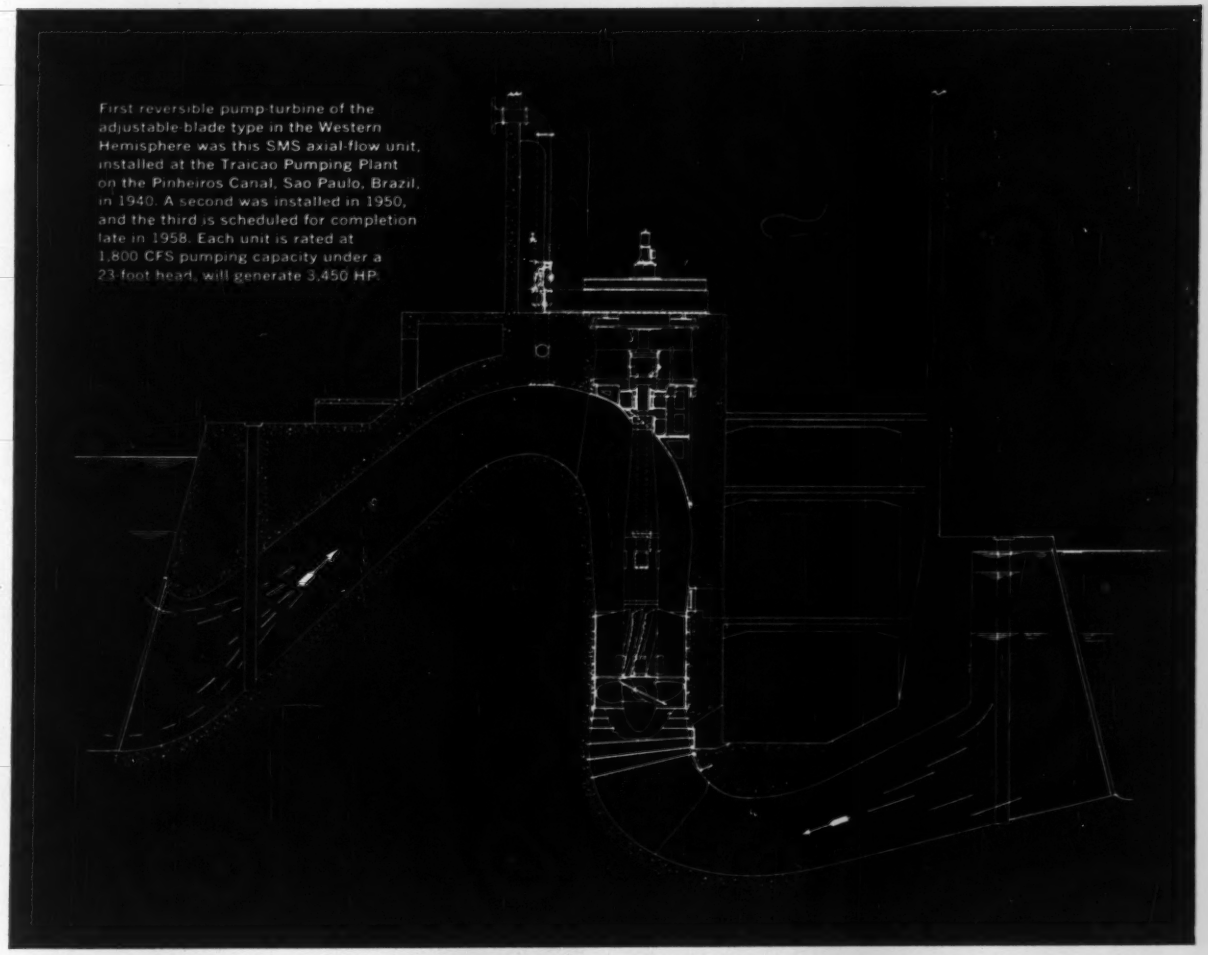
The Wabash Valley has a population of 2,500,000 and comprises 33,000 sq mi. In recent years, much oil has been found in areas along the river in both Indiana and Illinois and a vast expansion of the valley's resources is foreseen.

Pennsylvania to Try "Yield" Traffic Signs

The Pennsylvania Department of Highways has announced that it will experiment with "Yield Right-of-Way" signs to determine their effectiveness as traffic control devices. Similar signs have been tried in some other states recently to eliminate unnecessary full stops for vehicles entering a main highway from a subsidiary road.

Highway Secretary Lewis M. Stevens set up 30 to 50 locations throughout the state on recommendation of traffic engineers. State police will assist department personnel in evaluating results.

The signs are to be triangular in shape, with black letters on a reflectorized yellow background.



First reversible pump-turbine of the adjustable-blade type in the Western Hemisphere was this SMS axial-flow unit, installed at the Traicao Pumping Plant on the Pinheiros Canal, Sao Paulo, Brazil, in 1940. A second was installed in 1950, and the third is scheduled for completion late in 1958. Each unit is rated at 1,800 CFS pumping capacity under a 23-foot head, will generate 3,450 HP.

THIRD SMS PUMP-TURBINE UNIT ORDERED FOR TRAICAO PUMPING PLANT

These SMS adjustable-blade, axial-flow, pump-turbines at Traicao are the first reversible pump-turbines designed and manufactured in this hemisphere, and probably the only axial-flow units of this type in the world. SMS also manufactures other types. At the Pedreira Plant in Brazil, for instance, a more conventional centrifugal pump-turbine was installed in 1947. This SMS unit, operating under a 91.8-foot head, pumps 1,497 CFS at 138.5 RPM, and is rated at 16,000 HP when generating.

Recently, the Power Authority of the State of New York has placed an order with S. Morgan Smith for the manufacture of six pump-turbines for the Tuscarora Plant at Niagara Falls, New York. Each of these units is rated at 28,000 HP when generating, and at 3,400 CFS when pumping.

In addition to single-reversible, dual-purpose units like those at Traicao, Pedreira, and Tuscarora, SMS helped pioneer pumped-storage. The first large-scale application of separate pumps and turbines in the U. S. was for Connecticut Light & Power Company's Rocky River Plant, built in 1926. Here an SMS-Francis turbine, rated at 36,100 HP under a 226-foot head, was installed.

These installations are part of a broad background of experience in the engineering, designing and manufacturing of pump-turbines that is available to you at SMS. For information, write to S. Morgan Smith Company, York, Pennsylvania.

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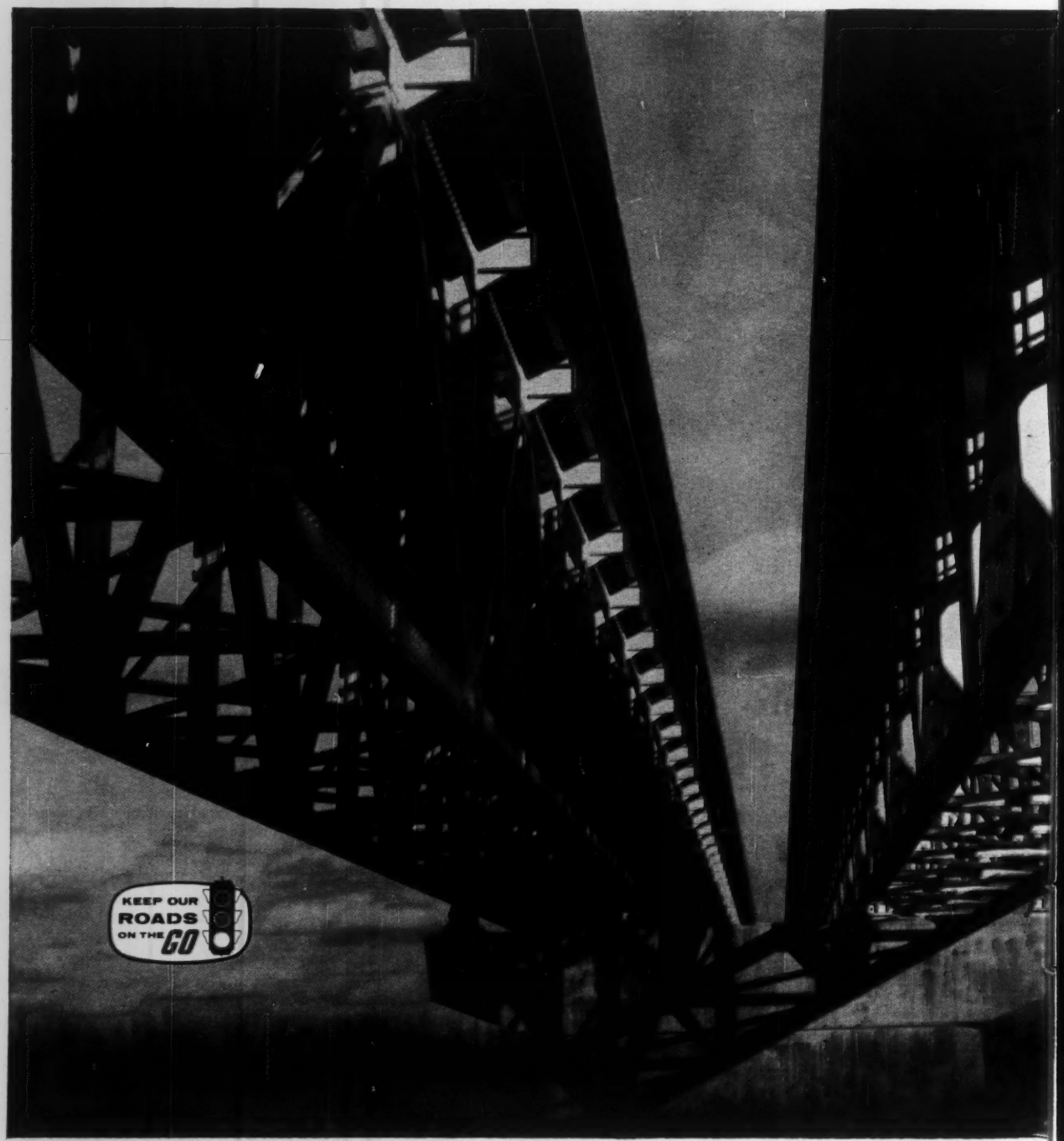
Bridge builders save



These twin, continuous deck roadways span 2306′ across the Kaw River, on 4310 tons of USS TRI-TEN Steel and structural carbon steel.

$100,000 with USS Tri-Ten Steel

in the Kansas Turnpike's biggest bridge

THIS BRIDGE would have weighed 4,810 tons if it had been built entirely from structural carbon steel. Instead, the designers used USS TRI-TEN Steel for the more heavily stressed chords and diagonals. Because of the stronger steel, these parts could be made thinner, and lighter—*500 tons lighter*, with an estimated saving of *$100,000* in total steel costs.

TRI-TEN Steel members can be made lighter with no loss of strength because TRI-TEN Steel has a much higher yield point than carbon steel—50% higher in thicknesses of ¾" and less—and it meets fully all of the requirements of ASTM Specification A242 for High-Strength Low-Alloy Steels. Because lighter members can be used, dead weight can be reduced as much as 20%, freight costs are lower, and construction is easier.

For more information about construction for maximum strength and minimum weight with USS High Strength Steels—TRI-TEN, COR-TEN, and MAN-TEN—write for a copy of *"Design Manual for High Strength Steels,"* United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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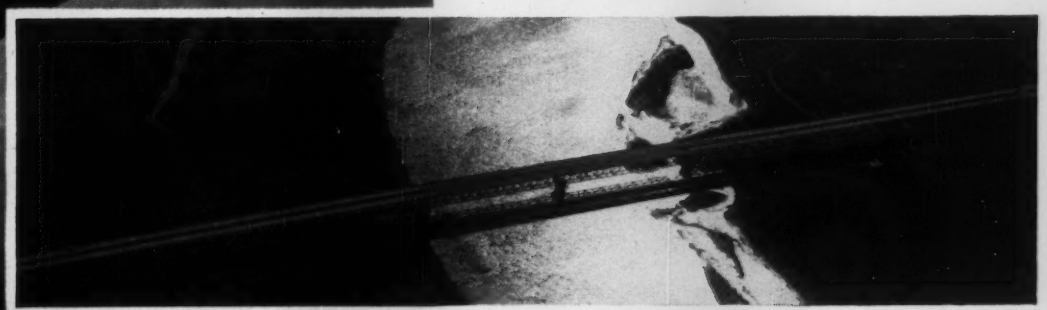
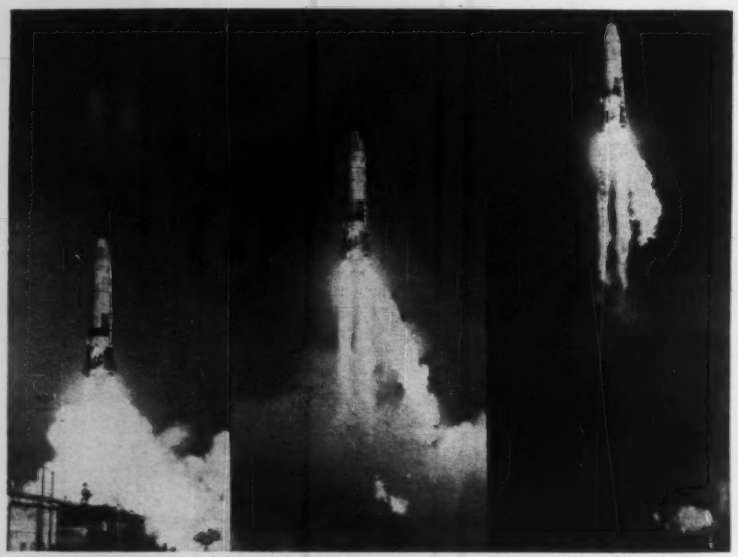


Fisher Memorial Bridge, Lawrence, Kansas
Owner—Kansas Turnpike Authority
Designer—Howard, Needles, Tammen & Bergendoff
Fabricator—Kansas City Structural Steel Co.
Erector—John F. Beasley Construction Co.

USS **United States Steel**



Before the blast-off . . .

Before this Atlas missile got off the ground, a lot of construction dollars had to be spent on base facilities. For a description of the construction involved, ENR went to Cooke Air Force Base in Southern California.

Cooke AFB:

Building a missile base involves two primary elements: support facilities and operational facilities. This is concluded from a visit to Cooke Air Force Base in California.

The support facilities are the housekeeping installations necessary for any land based armed force—barracks and quarters, messhalls, hospital, recreation facilities, chapels and warehouses. The operational facilities include all the things necessary to receive, store, check out and fire missiles.

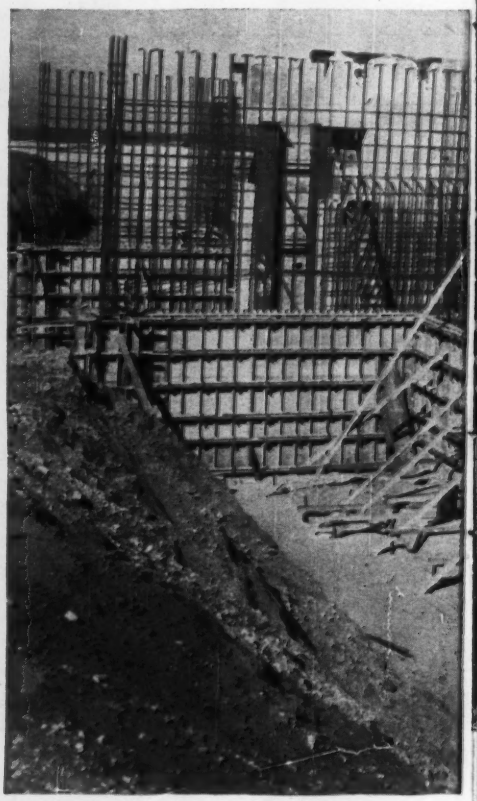
At Cooke AFB the support installations are being revamped from existing World War II buildings. The missiles facilities are, of course, new.

In addition, the plans for Cooke include construction of a new 8,000 ft runway.

Cooke AFB was selected for the Air Force missiles training center because it was an available, federally owned piece of real estate. Also, it is located near the Southern California headquarters of the Air Force's Ballistic Missiles Division as well as most of the prime manufacturers who are contributing to the Air Force program.

During World War II, as Camp

ATLAS MISSILE LAUNCH STAND is shown partly completed. Deep mat footing some 20 ft below this flame deflection pit transmits thrust forces to underlying ground.



REINFORCED CONCRETE BUILDING surrounds the Atlas missile launch stand to

Missile Construction Hums

Cooke, it served as the final training area for two Army armored divisions. The Air Force has taken over 67,000 acres of the 86,000 acre base, the Navy has just recently announced that it will use part of the remaining acreage for a missiles test center, and the Army still has an active detention barracks installation on another part of the area.

• **An operational base**—Although originally announced as a training base, Cooke has now been assigned to operations. There is no difference between the facilities required for training ICBM crews and those required for launching the huge missiles. And as the missiles have a range in excess of 5,000 mi. location is relatively unimportant. So, Cooke is now an installation of the Strategic Air Command, housing the First Missile Division of the Air Force.

Some staff officers and airmen are already at the base although the missiles facilities will not be operational for some time.

Currently under construction at Cooke Air Firce Base is a launching complex for the Atlas ICBM missile. Also being built is a launching complex for the Thor IRBM missile. This latter is only a training installation (there are no targets within the 1,500 mi. Thor range of Cooke). Construction will be started at a later date on facilities for the Titan ICBM missile. And a second Atlas complex is in the design stage along with other facilities to be added in the future.

• **Operations and support separated**—At Cooke the launching facilities are located some 5 mi. from the housekeeping area. In between the two will be the new 8,000 ft runway. Dispersal of runway, launching and housekeeping facilities at Cooke is not as great as probably will be the case for other operational facilities dedicated to but a single missiles system. The additional training function makes Cooke a bit different.

There is a small air strip in existence (used for liaison planes during World War II operations) but the new runway is required to handle the heavy air cargo planes to service the missile base. Missiles themselves will be shipped in either by air or truck. Rail transport is considered too rough for their delicate electronic guidance mechanisms.

For each particular missiles system there is provided a storage and assembly building. These are located with the housekeeping facilities. They could be located nearer the launching area at other installations if that is found to be desired.

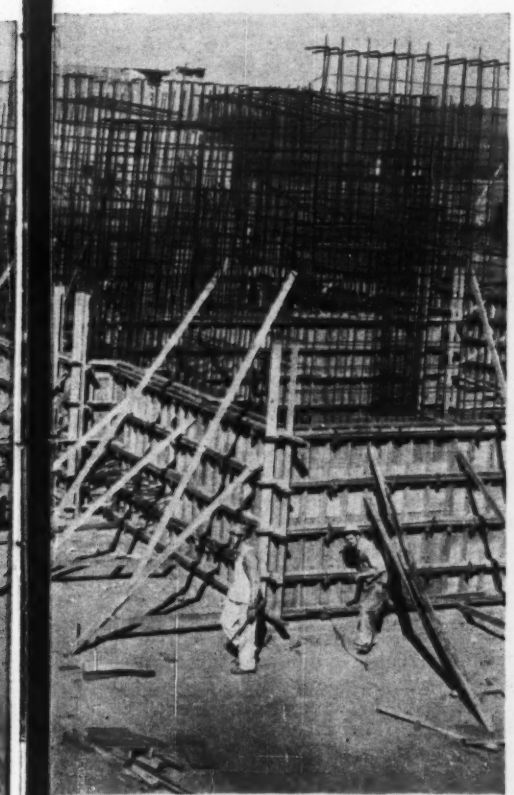
In these buildings the missiles will be put together and checked out so that when ready for firing they can simply be moved to the launch area, fueled and fired.

The assembly structure for the Atlas missile is a steel frame building 244 x 162 ft. The Thor assembly building is slightly smaller.

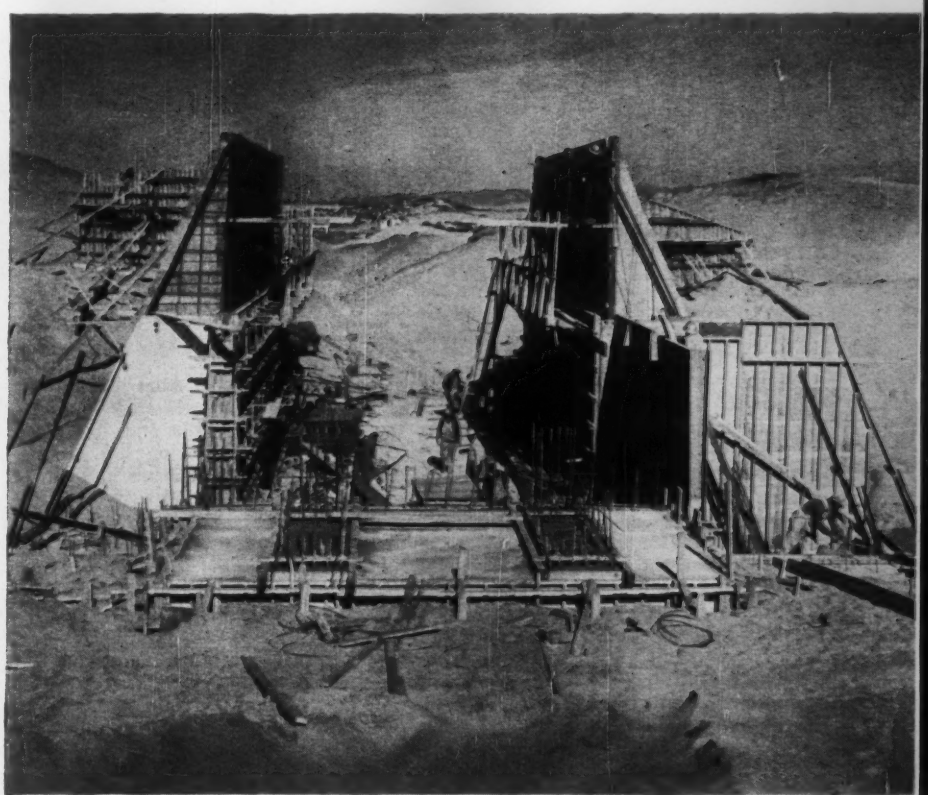
• **The launching facilities**—Exact nature of the facilities at the launching area depends on the particular fuels used and on the guidance system.

Both the Atlas and the Thor missile are fueled with a combination of liquid oxygen and rocket propellant No. 1. The latter is similar to jet fuel, a kerosene-type petroleum product.

▶ The Atlas launching system centers around a launch operations building which is a massive two-story reinforced concrete structure buried under a mound of earth. The launching crews will be in the operations building during the actual firing, watching the loading and firing through television screens

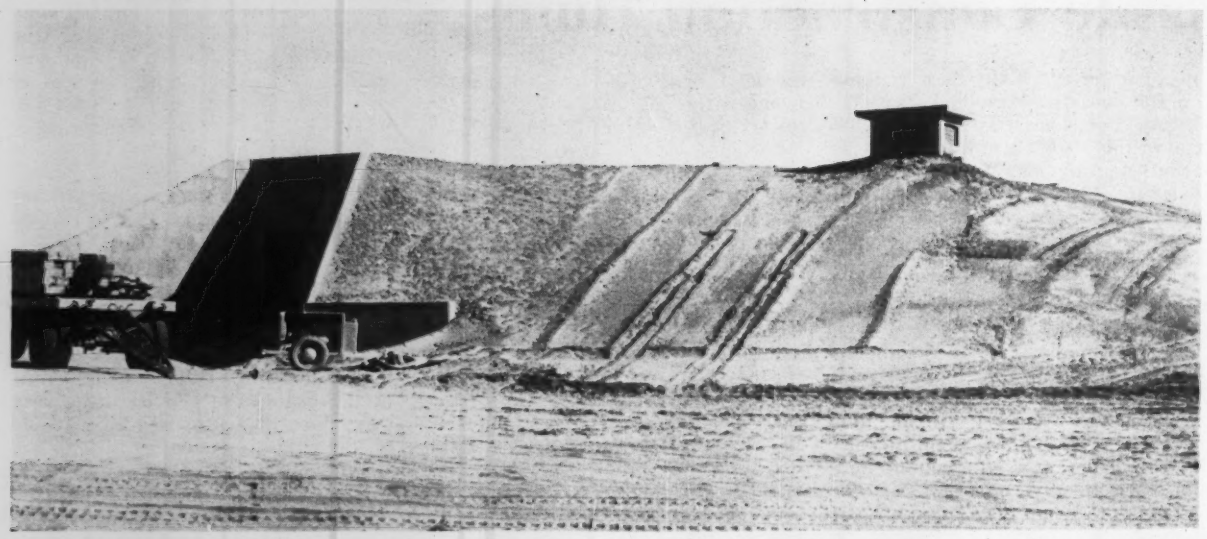


house among other things remote controlled fueling mechanism. Crews will operate here.



THOR LAUNCH STAND is simpler; service facilities will be truck mounted. Belled caissons support this concrete structure which is lighter than the Atlas stand.

. . . Buildings for launching and assembling the missiles



LAUNCH OPERATIONS BUILDING is two-story reinforced concrete structure backfilled with earth. Missile crew in building will observe fueling and firing through remote television installations. This is a massive two-story structure of reinforced concrete.

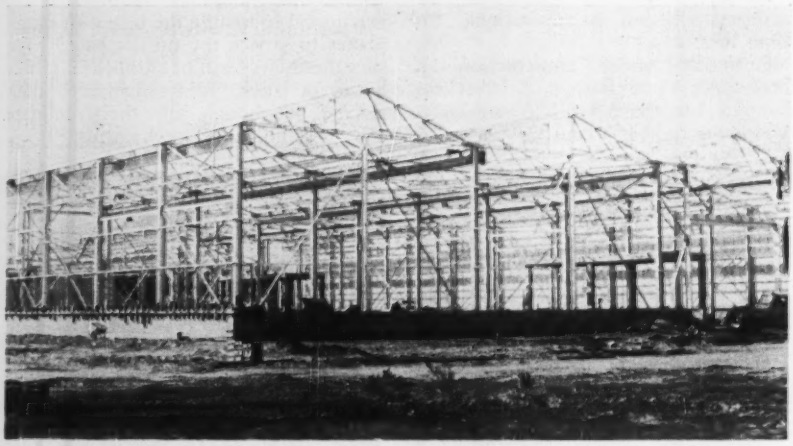
served by remote cameras. At other times, when not busy setting or adjusting a missile, the crews will use the building as a ready room. Crews will be on duty 24 hours a day on a shift basis.

The launch stands are grouped around the operations building a few hundred yards apart. Each launch stand has a service building adjacent to it that stores liquid oxygen and houses the fueling system. Located a few hundred yards to one side of the launch area are storage facilities for the rocket propellant; a water tank; a water pumping plant; and an electric generating plant.

Reason for the water storage and pumping facilities is that the flame deflector must be cooled while its rocket engines are being brought up to full power. For the Atlas installation, the water pumping facilities are rated at 25,000 gpm. Water comes from the regular base supply, but storage and pumping must be provided for short duration high-peak demands.

The nature of the firing of the Atlas results in a wet flame deflection pit. In other words, the flame of the rocket is deflected away from the launch area in a concrete lined pit. But the same pit also handles cooling water which is carried away through a concrete lined trench and wasted. The longest trench at Cooke is some 1,200 ft long.

Power installation for the Atlas facilities is rated at 4,000 kw and is made up of four 1,000 kw diesel generators. This installation is needed to provide a completely dependable power source and precise voltage regulation for the guidance system. The main base at Cooke is on commercial power.



ASSEMBLY BUILDING FOR ATLAS MISSILE is 244x162 ft steel structure. It is located with support facilities 5 miles away from the firing area.

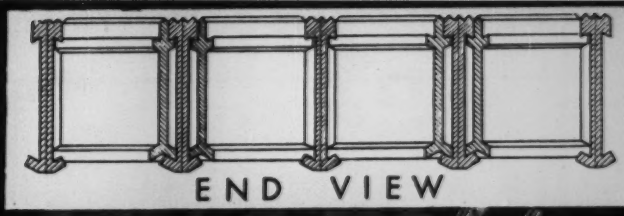
• **Concrete takes thrust**—The launch stand proper for the Atlas missile is in effect a thrust block that transmits weight of the missile and its service tower to the underlying soil. It also serves to resist the upward pull of the missile before it is released while the engines are gaining power. The mat footing is a 5 ft thick concrete slab 44 ft square. This is buried 23 ft in the ground with the flame deflection pit extending some 20 ft above ground surface. The missile is positioned above.

To resist overturning moment the launch stand has steel outriggers on separate footings extending some 35 ft on each side. Horizontal members are 14 WF 103 beams, and diagonal members are 12 WF 65's. Part of the reason for the massive foundations of the Atlas launch stand is that it is situated on soft shale and thus it is necessary to spread the load more than might be the case with better supporting material.

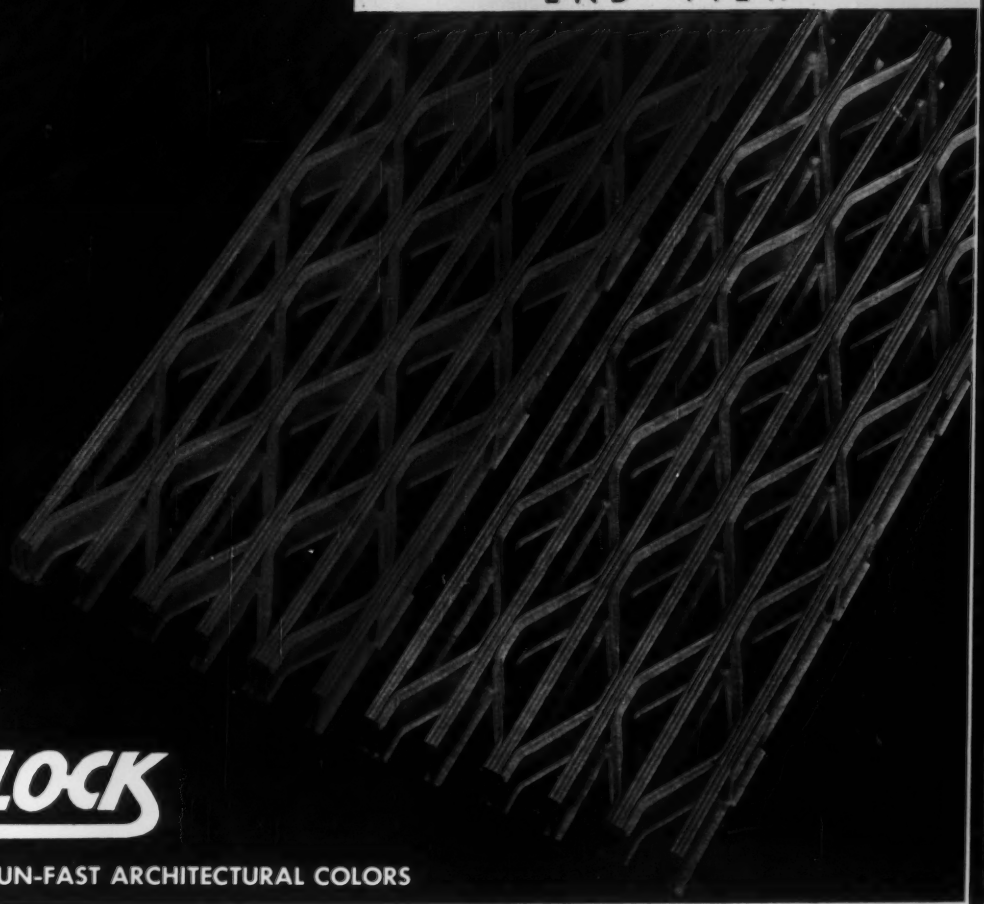
• **Hoisting tower needed**—Servicing each Atlas launch stand will be a service tower used for hoisting the missiles from horizontal to vertical position and placing the units on the launch stand. This tower has been designed but not yet constructed.

The service building adjacent to each launch stand is structurally separate from the stand—to minimize vibrations that would be transmitted from the launch stand to the reinforced concrete building. To prevent differential settlement between service building and launch stand the underground portions of the stand were backfilled with compacted soil-cement, 5% cement.

(*Continued on page 35*)



THE FORGES OF KERRIGAN



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← TEAR OUT AND FILE. VALUABLE CATALOG INFORMATION ON OTHER SIDE. WRITE FOR DESK SAMPLE E.

Weldforged GRATING DIVISION

KERRIGAN IRON WORKS, Inc.

Nashville, Tennessee

GENERAL SALES OFFICE - 274 MADISON AVENUE, NEW YORK, N. Y.

KERRIGAN SAFE LOAD TABLE FOR ROLL-LOCK ALUMINUM GRATING

Size of B. Bars	Type	Approx. Wgt. Lbs. per Sq. Ft.		DEFLECTION EQUAL TO 1/160 OF SPAN IS NOTED IN PARENTHESIS.																							
				(.150) 2'-0"		(.188) 2'-6"		(.225) 3'-0"		(.263) 3'-6"		(.30) 4'-0"		(.338) 4'-6"		(.375) 5' 0"		(.413) 5'-6"		(.45) 6'-0"		(.488) 6'-6"		(.525) 7'-0"		(.60) 8'-0"		(.675) 9'-0"	
1"	Roll Lock 1"	2.725	U	633		405	236	**281**	149	**207**	99	**158**	70	**125**	51	**101**	38	**83**		**70**		**60**		**51**		**39**		
			D	119		187	225	**.268**	263	**.346**	.30	**.477**	338	**.604**	.375	**.746**	.413	**.903**		**1.074**		**1.261**		**1.461**		**1.909**		
			C	633		507		422	326	**362**	249	**317**	197	**281**	159	**253**	131	**230**	110	**211**	94	**195**	81	**181**	62	**158**	49	**141**
			D	095		149		215	263	**.292**	.30	**.382**	338	**.479**	375	**.597**	.413	**.722**	.45	**.859**	488	**1.008**	525	**1.169**	60	**1.527**	675	**1.933**
1¼"	Roll Lock 1¼"	3.204	U	931		596		414	274	**304**	183	**233**	129	**184**	94	**149**	70	**123**	54	**103**	43	**88**		**76**		**58**		**46**
			D	095		149		214	263	**.292**	.30	**.381**	338	**.482**	375	**.595**	.413	**.720**	.45	**.857**	488	**1.006**		**1.166**		**1.523**		**1.928**
			C	931		745		621		532	458	**465**	362	**414**	293	**372**	242	**338**	203	**310**	173	**286**	149	**266**	114	**234**	90	**207**
			D	076		119		171		233	.30	**.305**	338	**.386**	375	**.476**	413	**.576**	.45	**.686**	488	**.805**	525	**.933**	60	**1.219**	675	**1.543**
1½"	Roll Lock 1½"	3.693	U	1276		817		567		417	301	**319**	212	**252**	154	**204**	116	**168**	89	**142**	70	**121**	56	**104**	37	**.79**		**63**
			D	079		123		177		242	.30	**.315**	338	**.399**	375	**.493**	413	**.596**	.45	**.709**	488	**.833**	525	**.965**		**1.261**		**1.596**
			C	1276		1021		851		729		638		567	482	**510**	399	**464**	334	**425**	285	**392**	246	**364**	188	**319**	148	**283**
			D	063		099		143		195		254		322	375	**.397**	413	**.480**	.45	**.572**	488	**.671**	525	**.778**	60	**1.016**	675	**1.286**
1¾"	Roll Lock 1¾"	4.91	U	1957		1253		870		639		489	384	**386**	279	**313**	210	**258**	161	**217**	127	**185**	102	**160**	68	**122**	48	**96**
			D	067		105		151		206		269	338	**.340**	375	**.420**	413	**.508**	.45	**.605**	488	**.710**	525	**.823**	60	**1.075**	675	**1.360**
			C	1957		1566		1305		1118		979		870		783		712	607	**652**	517	**602**	446	**559**	341	**489**	269	**435**
			D	054		084		121		165		215		272		336		406	.45	**.484**	488	**.568**	525	**.658**	60	**.860**	675	**1.088**
2"	Roll Lock 2"	6.28	U	2984		1910		1326		974		746		589		477	359	**394**	276	**331**	217	**282**	174	**243**	116	**186**	82	**147**
			D	060		094		135		184		240		304		375	413	**.454**	.45	**.54**	488	**.634**	525	**.735**	60	**.96**	675	**1.215**
			C	2984		2387		1989		1705		1492		1326		1194		1085		995	884	**918**	761	**852**	583	**746**	460	**663**
			D	048		075		108		147		192		243		30		363		432	488	**.507**	525	**.588**	60	**.768**	675	**.972**

Aluminum type 6063T6 used for bearing bars—type 6063T5 for crimped bars

Using Aluminum type 6061T6 for bearing bars, add approximately 20% to above table . . . . (slightly higher in price)

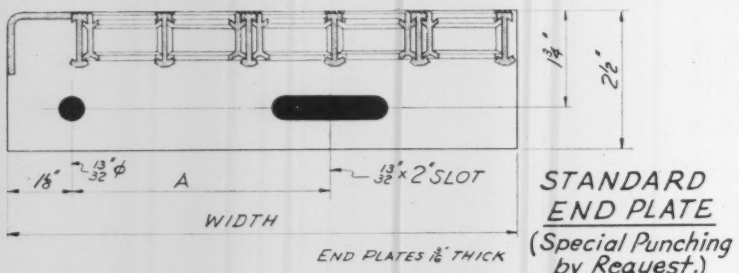
KEY FOR LOAD TABLE

U—Uniform load capacity in pounds per square foot. C—Concentrated load capacity in pounds per foot of width. D—Deflection in inches. All loads based on 10000 psi allowable stress. All deflections based on 10000000 psi Modulus of Elasticity. All loads are theoretical, wgt. of grating not deducted. Loads shown with yellow background will cause deflection in excess of 1/160 of span.

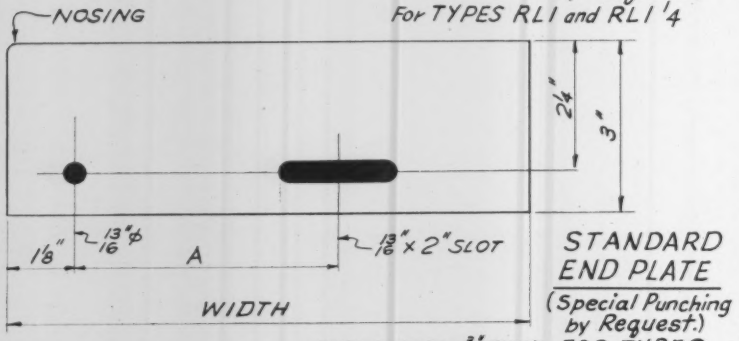
FRACTIONAL WIDTH PANELS FURNISHED TO FILL OUT OVERALL AREAS

25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
35⅞	34⅜	32⅞	31 7/16	30	28½	27	25 9/16	24	22 9/16	21⅛	19⅝	18 1/16	16 1/16	15¼	13¾	12¼	10 3/16	9 1/16	7⅞	6⅜	4 1/16	3 7/16	2

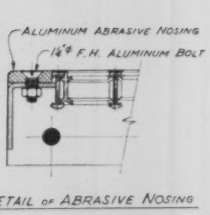
STAIR TREADS



STANDARD END PLATE (Special Punching by Request.) For TYPES RL1 and RL1 ¼



STANDARD END PLATE (Special Punching by Request.) FOR TYPES RL1½ and RL1¾

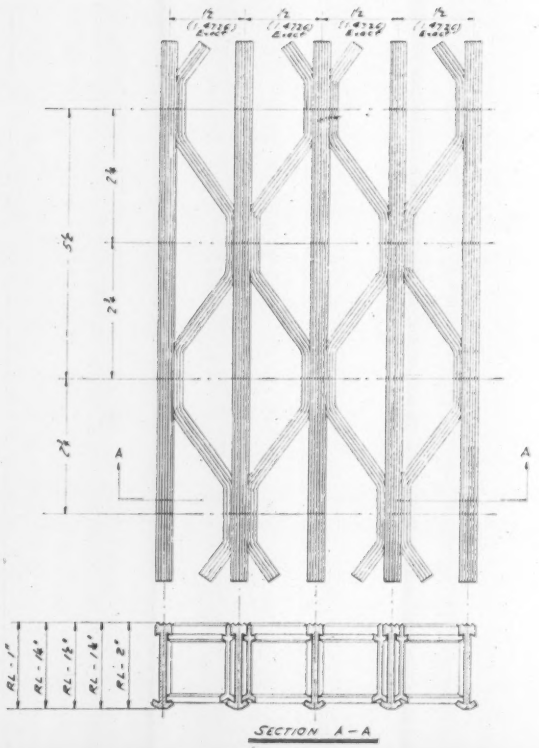


DETAIL OF ABRASIVE NOSING

TABLE OF TREAD WIDTHS

WIDTH	DIM. A
5⅛	2½
7⅛	4½
8⅛	4½
10⅛	7
11 13/16	7
13⅛	7

ALUMINUM GRATING
ROLL-LOCK TYPE

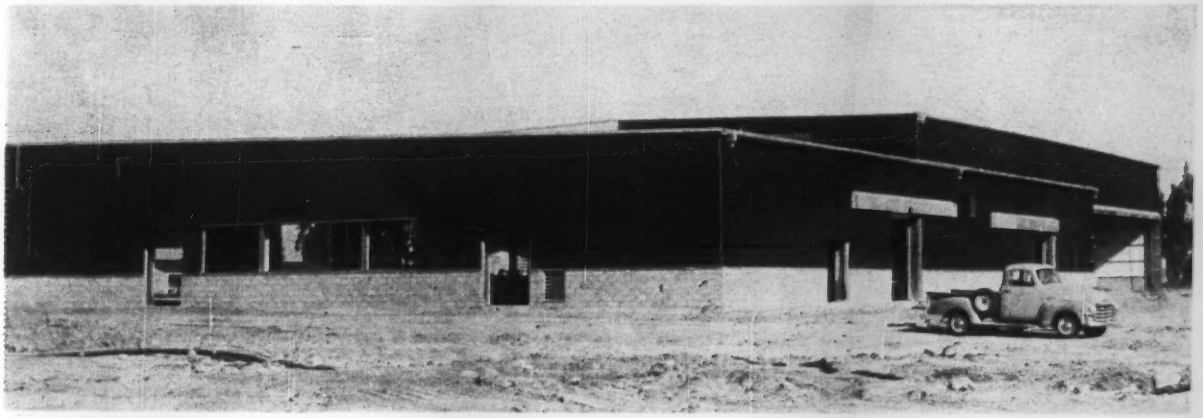


SECTION A—A

KERRIGAN IRON WORKS, Inc.
Nashville, Tennessee
GENERAL SALES OFFICE - 274 MADISON, N.Y.C.

Weldforged GRATING DIVISION OF . . .

. . . Behind missile launching—tanks, pumps and buildings



THOR MISSILE ASSEMBLY BUILDING is smaller than Atlas assembly building. It, too, has a structural steel frame.

The service building houses the fueling system and the liquid oxygen storage. Due to the caustic characteristics of the oxygen and its rate of evaporation, it is not introduced into the missile until the time for firing. Liquid oxygen is stored at each service building in a 12 ft dia by 61 ft long stainless steel tank. Piping includes 6 and 8 in. dia stainless steel lines.

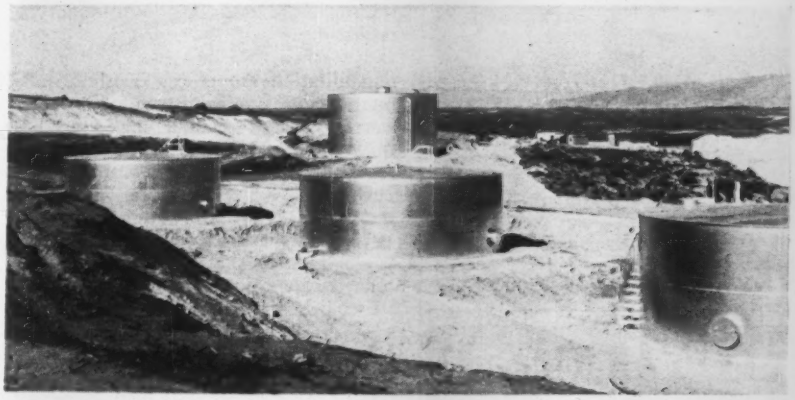
Guidance system for all three launch stands is located a safe distance away from the firing area—perhaps two miles. One of the requirements is that the launch stands must be seen from the guidance building. Another requirement is that there be available long relatively flat stretches for the legs of the system.

The particular guidance control system installed for the Atlas missiles has two legs arranged in a cross shape, each several thousand feet long. Running down these legs are wave guide cables installed in concrete troughs placed to limiting grade variations. An improved system has been developed that will require shorter legs. This will be used on some of the future installations.

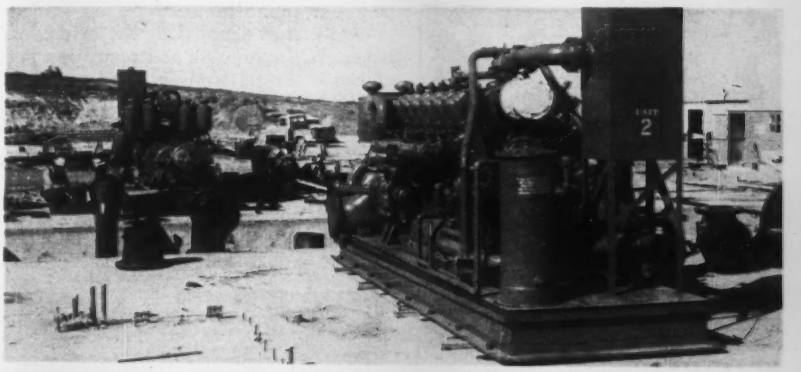
At the center of the guidance control system is a concrete frame building with concrete block walls housing the guidance mechanisms including electronic computers.

► The Thor installations are smaller and simpler. One reason is that the missile is smaller, shorter range. But the concept of the Thor missile is different in that it is meant to be mobile. All the checkout and control equipment is mounted on trailers as are the liquid oxygen facilities. And no massive service tower is involved as this too is truck mounted. Thus, at Cooke AFB, there must be provided parking areas for the Thor trailers.

The launch stands for the Thor missile, however, must be constructed similar to the Atlas launch stands. Here, too, wet frame deflection pits are involved. But due to the lesser weight, belled caissons are used in foundations rather than mat footings.



TANK FARM for Atlas missile installation includes a water tank and three tanks for rocket propellant—similar to jet fuel.



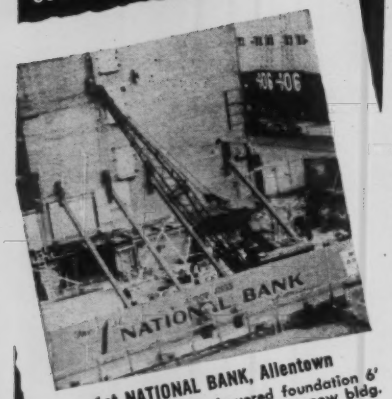
WATER PUMPING INSTALLATION for Atlas launch stand has heavy diesel-powered pumps. Capacity of 25,000 gpm will provide water for cooling missile during firing cycle.

• **Support facilities**—Currently under contract at Cooke is some $16 million of construction. This will be increased substantially at a fairly rapid rate; the total program through 1960 is expected to reach $100 million.

About $8 million of the existing contracts is for support facilities. And most of this program is rehabilitation of World War II buildings. There are nearly 200 buildings involved.

An example of the rehabilitation work is barracks reconstruction. During World War II, the two-story, 63 man barracks housed the enlisted men in large open rooms. These are being

From our
50th Anniversary Album



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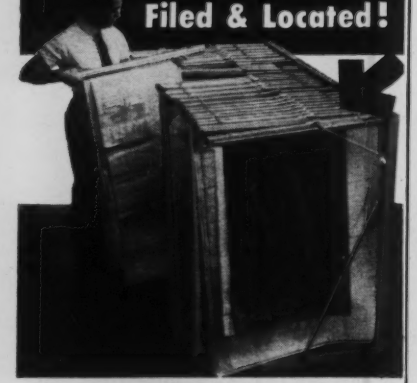

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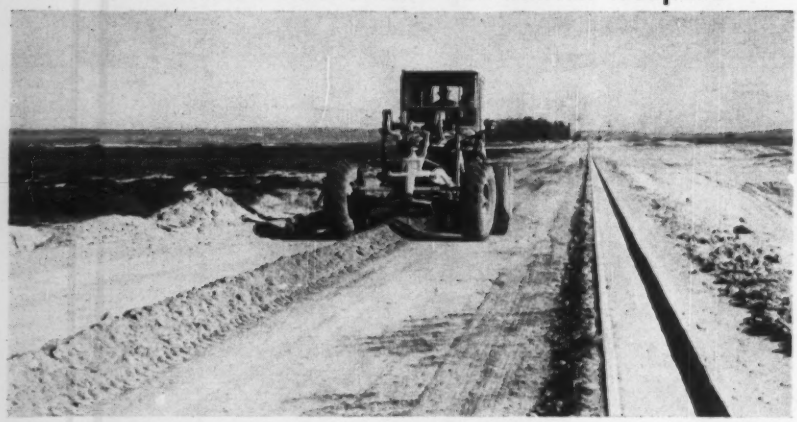
. . . Conventional construction for modern weapons



GRADING SERVICE ROAD for 10,000 ft long guidance system leg. Concrete trough will hold wave guide cable at the right of the roadway.

revamped to provide dormitory type installations with two men to a room and 35 men to a building. Also under rehabilitation are officer quarters, hospital facilities, administration building, warehousing, recreation buildings, commissary post exchange and chapels.

About the only new construction currently involved are three 1,000 man messhalls. The Army during World War II worked on a company mess basis which is considered inefficient for today's operation. Also to be constructed is a new swimming pool.

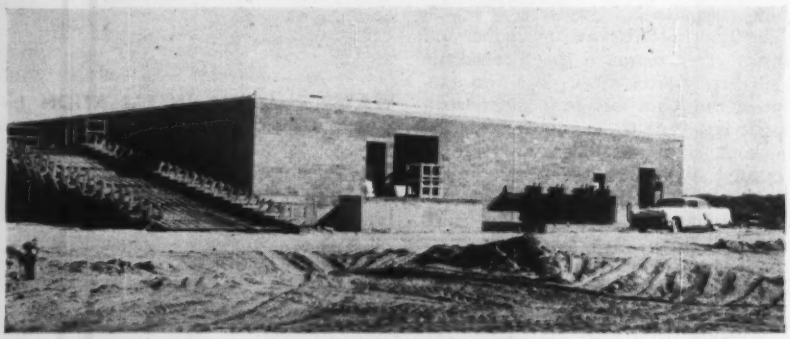
• **Includes Capehart housing**—An indication of the scope and permanence of Cooke AFB is its 880 unit Capehart family housing project. This work is well along and includes three- and four-bedroom frame houses.

One of the reasons for the extensive nature of the housing and recreation facilities is the relatively isolated location of Cooke. Although its oceanside position on the California coast is quite attractive, it is near no large towns. Closest is Lompoc, about five miles away, with a 1950 population of 5,520. The town of Santa Maria (pop. 13,114) is located about 25 miles away. Population at Cooke will likely exceed the combined total of Lompoc and Santa Maria.

Santa Barbara, the largest nearby city, is about 60 miles away. Los Angeles is 150 miles to the south.

• **Who is involved**—Many design and construction firms are involved in the work at Cooke AFB. Designing the Atlas facilities are Holmes & Narver, Inc. Designing the Thor facilities are Daniel, Mann, Johnson & Mendenhall. Designing the rehabilitation of the support facilities are Koebig & Koebig. The liquid oxygen facilities for all BMD programs is being developed by Arthur D. Little, Inc. Some facilities such as the runway are being designed by the Los Angeles District, Corps of Engineers.

All of the construction is on a bid basis. The P. J. Walker Co. has contracts for the 1,000 man messhalls, for the assembly and storage buildings, and for the guidance stations. Vinnell Co., Inc., has a contract for construction of the Thor facilities. The Atlas facilities are being built by a joint venture of Fredericksen & Kasler and Stolte, Inc. The rehabilitation work as well as the Capehart housing is being built by the George A. Fuller Co.



CONTROL HOUSE FOR THOR MISSILE is concrete block building. Ramp at left is for trailer unit that hauls the transportable missile hardware.

Construction view of Central Office Building, State of Minnesota Dept. of Highways, St. Paul. R/C Duct underfloor electrification was easily installed. Contractors: Lovering-Sweitzer; Architects: Ellerbe & Co.

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Every engineer and contractor faces interruptions in the building time-table. But you can avoid undue delays caused by weather when you build with Ceco Steeldomes. For they are impervious to the elements . . . never get soggy, limp or distorted. Since Steeldomes are rigid, you can accurately pre-determine concrete quantities, and be assured of a high quality finish, too. Another advantage—it costs less to place rebars on a rigid Steeldome deck. And after the pour has cured, Steeldomes are easily removed. There is no costly clean-up. To speed building, to save material and labor . . . use Ceco Steeldomes—the best way to form two-way dome construction. Ceco Steel Products Corporation—general offices: 5601 West 26th Street, Chicago 50, Illinois. Offices, warehouses and fabricating plants in principal cities.

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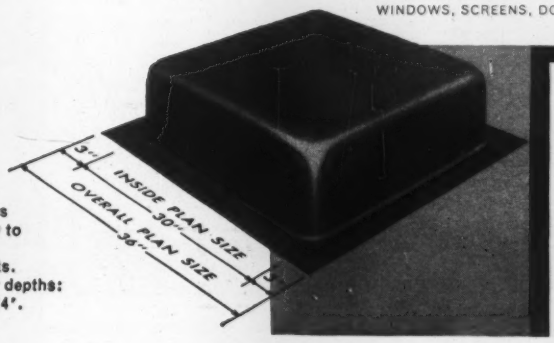

Ceco Steeldomes provide flexibility to meet span and load requirements. Available in four depths: 8', 10', 12' and 14'.

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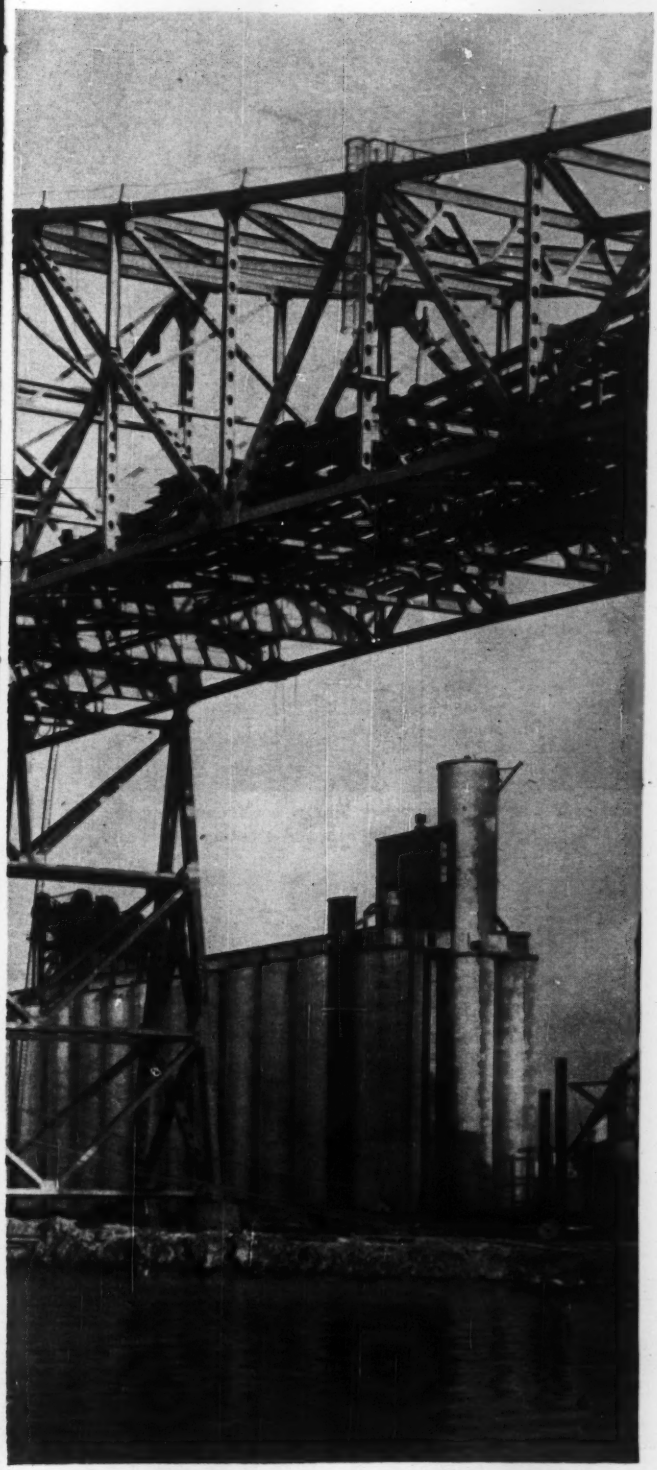
ENR

Flynn aluminum bridge railing

City of Chicago Calumet Skyway Toll Bridge, built by Dept. of Public Works. Consulting Engineers. De Leuw, Cather & Co., Chicago. Photograph by Hedrich Blessing.

chosen for Chicago Calumet Skyway

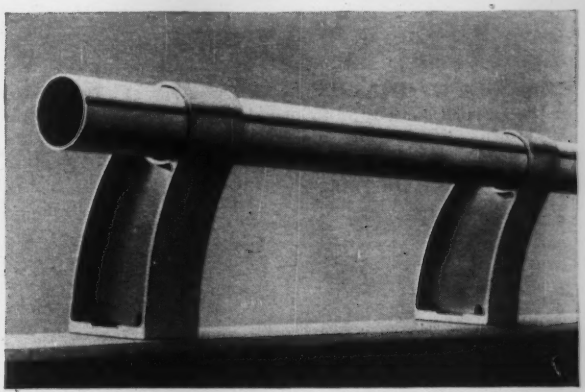


New shape of things to come!

This is a section of Chicago's Calumet Skyway Toll Bridge project, soaring out of the Southeast and spanning some seven and a half miles between the Indiana East-West Toll Road and the Chicago South Side. Michael Flynn is supplying extruded bridge and highway railing for this vast project—more than 56,000 feet of lightweight, low-cost aluminum rail.

This $101 million Skyway must serve the growing needs of Chicago for many years to come—one reason why *lasting aluminum* railing was specified. Flynn rails and posts never need painting, never require replacement or costly maintenance. Installation is handled by a *two-man team*, without the use of cranes or lift-trucks. It's fast, clean, easy work. And when construction schedules are tight, as they are on Chicago's Skyway, you can depend on Flynn for fast, prompt delivery.

Perhaps you're planning a project right now, a project in which Flynn bridge and highway railing could save you money and time—and trouble, later on. Flynn's system of *standard designs* makes possible many distinctive post-and-rail combinations, limited only by your imagination and the problem at hand. The man from Flynn would like to talk to you about it. Call or write him, soon.



More than 56,000 feet of railing and 6,474 Flynn post castings will be used on Chicago's Calumet Skyway. This post is one of many Flynn standard designs, available to you for distinctive, low-cost bridge and highway construction.

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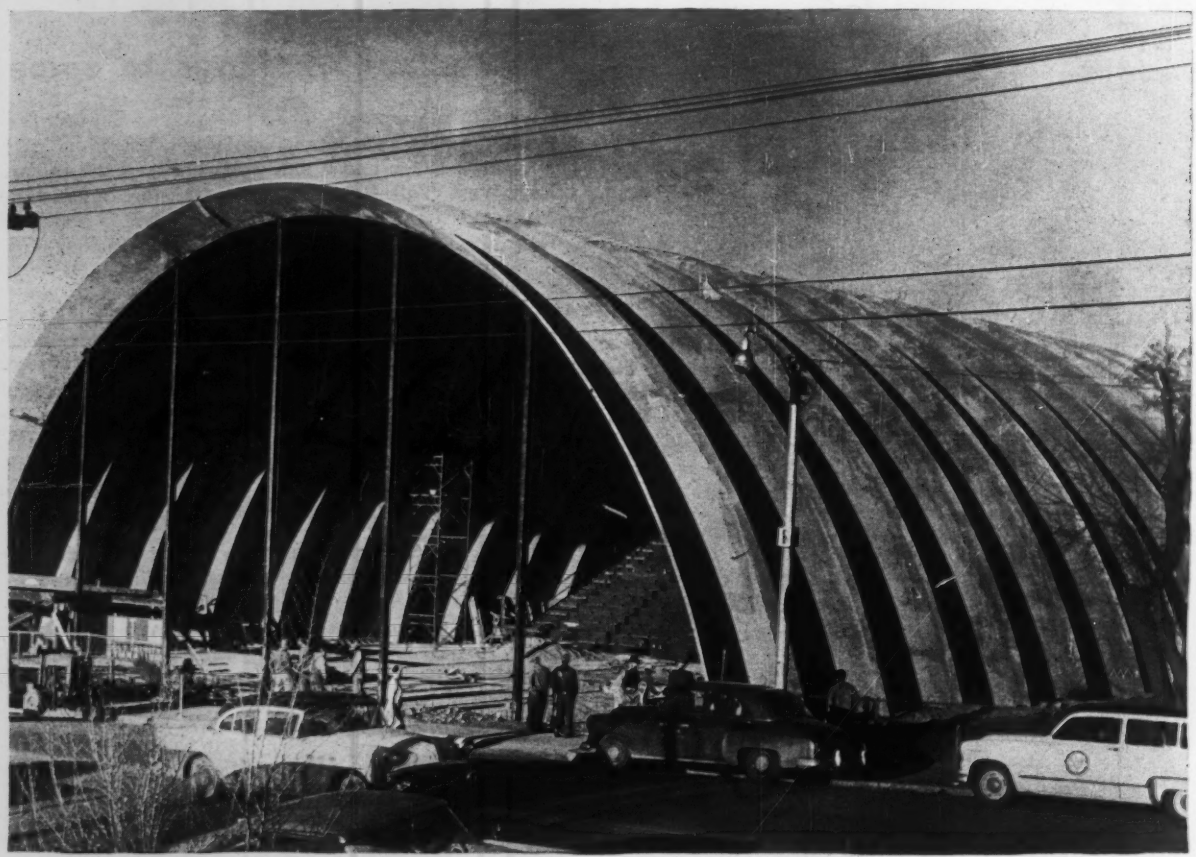
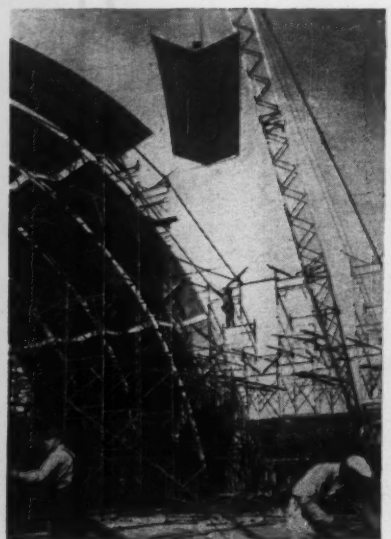
EXTRUSIONS

Precast Sections Make a Corrugated



CONCRETE GYMNASIUM ROOF spanning 115 ft was built of precast shell sections 31 ft long along the arch and 10 ft wide. The elements were field-connected into a continuous unit by lapping and welding the reinforcing bars and grouting the joints.

STEEL STRONGBACK picked up precast sections, distributed hoisting loads to four two-bolt inserts embedded in the concrete.



LIFTED BY CRANE, the V-shaped sections were placed on steel scaffolding, which supported them until connections were made.

SLOPE of the segment being erected was preset to its correct in-place angle by adjustment of the lengths of the sling legs.

Barrel Roof

A fairly well known structural type and a frequently used building method came together in an uncommon but successful combination in the construction of a new gymnasium for Holy Trinity High School, Trinidad, Colo. The structure is a barrel-shaped reinforced concrete shell of the corrugated or folded-plate type, built up with short precast segments.

In plan the gym is 115 x 133 ft. The shorter distance is spanned without intermediate supports by circular arches made up of five precast segments. Along the arc the full shell measures about 158 ft and the individual segments about 31 ft each. Grout-filled connections between the butting ends of the segments comprise the additional few feet. The segment cross section is a V, 10 ft 3½ in. wide and 2 ft 9 in. deep. Repeated 13 times, it makes up the length of the gym. Concrete thickness is a uniform 3¼ in.

• **Construction**—The sections were cast at the site in five identical forms with truck-mixed concrete from a local plant. Four two-bolt inserts for pick-up were cast into each shell segment. Reinforcement for the shells consists of welded-wire fabric top and bottom throughout the entire area, plus longitudinal and transverse bars at the peaks and valleys.

Steel scaffolding was erected as falsework for the erection. Segments were lifted by crane, with lifting loads distributed to the four pick-up points by a steel strongback. Sling legs were adjusted to suspend the shell segment at its in-place angle.

After the five arch segments of a full span were in place on the falsework, projecting bars were spliced by welding, the additional steel required at the joints was placed, and the joints were grouted pneumatically.

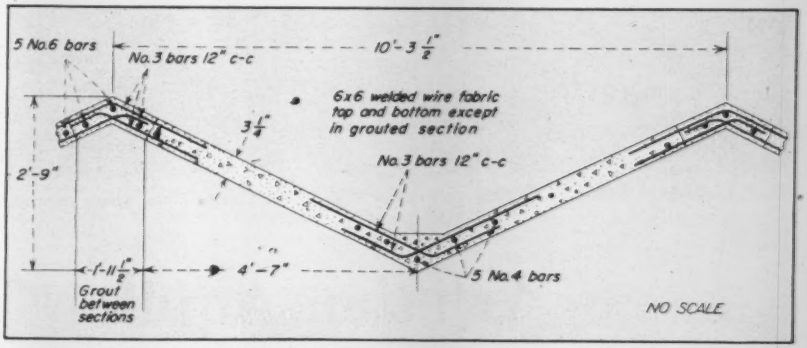
There are no ribs or columns stiffening the shell. The first 10 ft wide arch span was guyed before being decentered, but thereafter, the increased length of the structure was sufficient to make it stable. The building is closed in at the ends with masonry walls, each stiffened with five steel columns.

The exterior of the shell was waterproofed with a sprayed-on plastic.

All-steel seats in the gym will accommodate about 1,200 persons. Lockers and showers are located under the seat sections.

Architects of the project are Toll & Milan, of Denver. Henry J. Boland, Denver, is consulting engineer. Platt-Rogers Construction Co., Colorado Springs, holds the $175,000 general contract.

SAWTOOTH PROFILE of the building reveals the folded-plate characteristic of the sections which stiffens them, making each segment function as a rib.

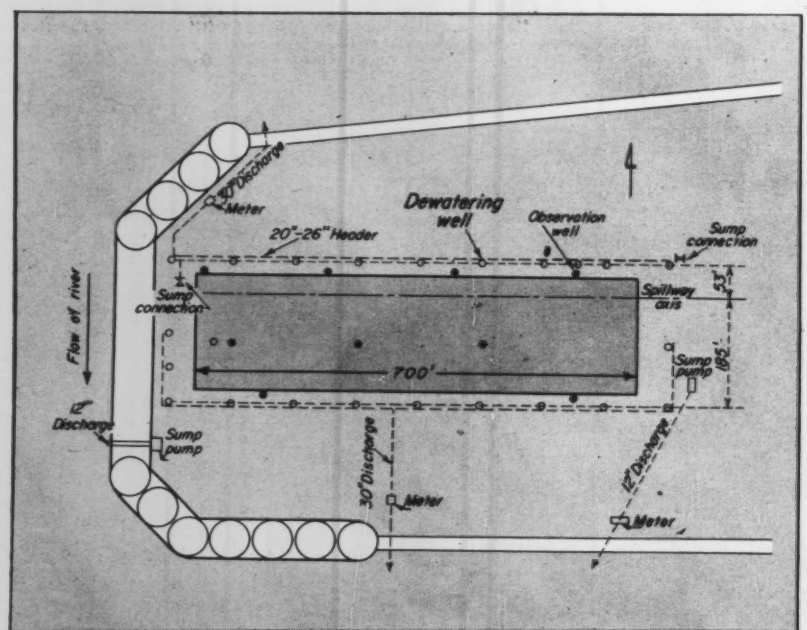


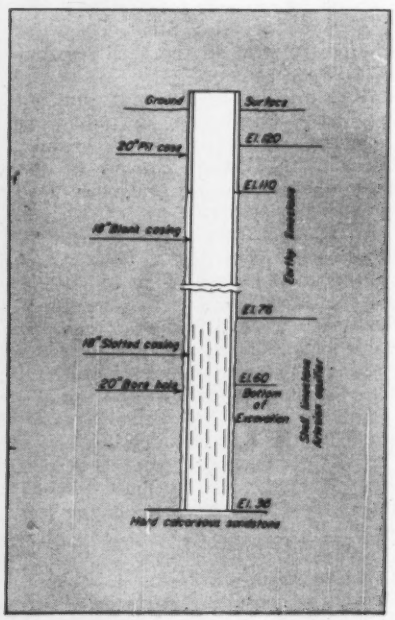
CROSS SECTION OF SEGMENT shows typical reinforcement for a base segment. Dimensions are typical for all sections except for slight differences at ends of building.

READY FOR GROUTING, the gymnasium contains 13 rows of the precast segments. After completion of the shell, the building was closed in with masonry end walls.

COFFERDAM HANDLES RIVER at spillway site of Ft. Gaines Dam where excavation has been made into artesian aquifer . . .

Artesian Aquifer Is Held Down in





RING OF WELLS around spillway excavation keeps 40 ft thick artesian aquifer layer in check. At right is a typical dewatering well. Observation wells are simple boreholes. Contractor is paid at gallon rate for dewatering.

. . . **BUT TO GET BONE-DRY WORK AREA** called for ring of wells (note one header at right) to handle the powerful aquifer.

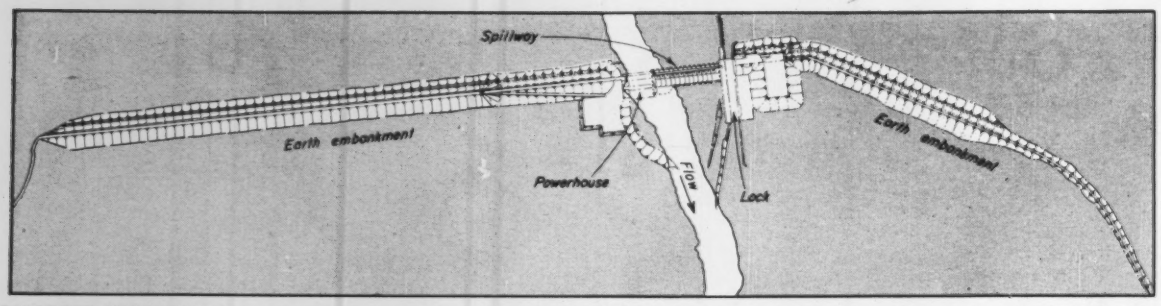
Spillway Cut

It's a remarkably dry hole into which concrete is being placed at the Ft. Gaines damsite on the Chattahoochee River, Ga. This is especially noteworthy because the concrete—for the spillway section of the $86 million U. S. Army Corps of Engineers project—is going into a cut made in an artesian aquifer so strong that the now-bone-dry site would be quickly covered with 60 ft of water should the dewatering system shut down.

Excavation for the 692-ft-long 115-ft-high spillway enters 16 ft into an artesian aquifer of shell limestone that is about 40 ft thick. This was under an earthy limestone layer some 44 ft deep, which in turn was topped by roughly 30 ft of sand and clay. The shell limestone rests on a hard calcareous sandstone. Elevations are: original ground at 150, clay and sand down to 120, earthy limestone to 76 and shell limestone to 35. The foundation cut reaches down to El 60.

• **System of wells**—The aquifer is being kept under control by a system of wells surrounding the excavated area. The

CONCRETE IS CAST against face of cut. Excavated area is almost dust dry—the small amount of water seen is from workmen's hoses. Cut is 16 ft into artesian aquifer.



CONCRETE SPILLWAY is now under construction. One earth embankment, except for connecting section, is finished. Other embankment, powerhouse and navigation lock are yet to be built.

spillway is being built mostly on land, with only a small portion extending into the river, and a cofferdam system encloses the site to keep out river water.

The aquifer water is handled by 24 wells, 21 working and three spares, that run down to El 35—the top of the sandstone, 25 ft below the bottom of the spillway excavation.

A typical dewatering well is a 20-in. borehole with a 20-in. pit case down to El 110. An 18-in. blank casing is used through the remainder of the earthy limestone layer. From El 76 to 35—the shell limestone aquifer—an 18-in. slotted casing is used.

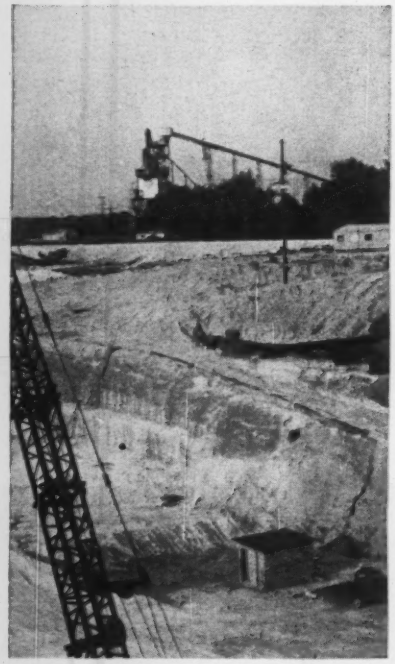
The wells are placed on 100 ft centers upstream, on 200 ft downstream, on 60 ft riverside and 120 ft shoreside. Diesel driven deepwell turbine pumps, rated at 1,500 at 1,750 rpm on 105 ft head, pump out water at a total rate of approximately 8,000 gpm. Each well is serviced by its own pump which discharges into a header running from 20 to 26 in. in diameter. Three metered outlets through the cofferdam complete the dewatering setup.

• **Bone-dry hole**—The end result of this smoothly functioning dewatering system is a good dry hole in which to place concrete for the ogee type spillway.

Concrete starts at El 60 and the crest will be at 163. First concrete was placed late last summer under a night concreting schedule for the months of June through September. Excavation of the pit has been completed and placing concrete for the spillway should go on for a year in all.

The pours are made directly against the exposed limestone. Face of the pit is an exceptionally smooth surface cut by a scraper after blasting and bulldozing. The last 6 in. of any level is dug out within 12 hours of placing concrete to protect the exposed face from weathering. Five-foot lifts are used and concrete is covered with burlap which is kept wet with a continuous fine spray of water during curing.

The massive weight of the finished spillway will offset the lift of the artesian aquifer. But the spillway apron with its relatively light weight, will be anchored in place. Some 800 2½-in. rods will be grouted into belled holes, 50 ft deep and 6 in. in diameter drilled into the limestone, to hold the slab firmly.



BATCH PLANT is just off excavation; concrete goes to cut in bucket-hauling truck.

A batch plant, which features two 4-cu-yd mixers, has been set up just off the work area. It is fed from aggregate piles heaped by bottom dump railroad cars riding a trestle above the piles. A conveyor-belt-equipped reclaiming tunnel beneath the piles carries the aggregate to the batching plant which is equipped with a rescreener. The concrete is delivered to the excavation in air-operated 4-cu-yd buckets carried on trucks.

• **Earth embankments**—The spillway—which will be fitted with fourteen 42x29-ft hinged tainter gates—is under a $6½ million contract to Hardaway Contracting Co., Columbus, Ga. A 130,000 kw capacity powerhouse to the right of the spillway is yet to be let. The same is true for a navigation lock to be located on the left side. It will measure 82x450 ft and have a maximum lift of 88 ft.

Of the two earth embankments one is already in place. Each runs about 6,000 ft long with a crest width of 30 ft. Maximum height above natural ground is 66 ft and maximum width at bottom is 300 ft.

The embankment is rolled earthfill with upstream and downstream slopes of 2½:1. Upstream half of the embankment is of impervious fill and downstream is of random material. The two halves meet on a slope line of 3:1 slanted toward the upstream side.

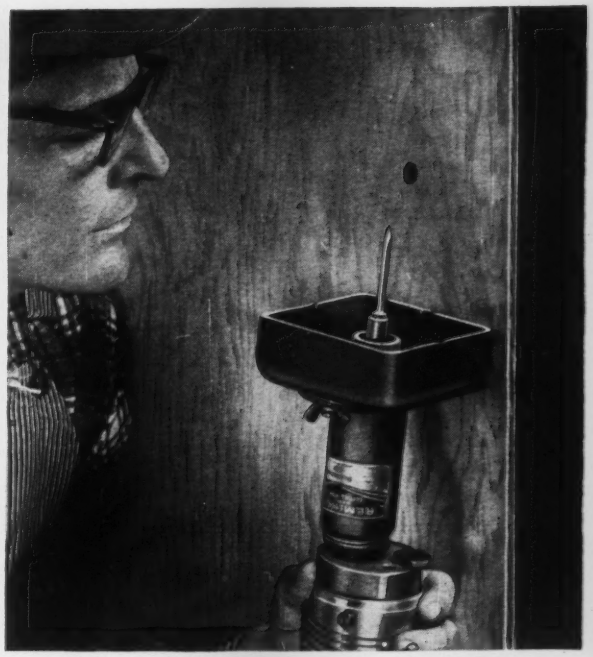
• **Part of a bigger scheme**—The Ft. Gaines project is one unit in a comprehensive development of the Apalachicola, Chattahoochee and Flint Rivers (ENR Mar. 14, p. 28). One feature is to provide a 9 ft deep navigation channel from the Gulf Intracoastal Waterway to Columbus, Ga., on the Chattahoochee, and to Bainbridge, Ga., on the Flint River.

Four dams are now involved in the development. Buford Dam, upstream of Ft. Gaines on the Chattahoochee, is practically completed. So is Jim Woodruff, which is located on the Apalachicola where it splits into the Chattahoochee and Flint. Then, not far downstream from Ft. Gaines the Columbia Dam and Lock will be started in time to be finished with the Ft. Gaines project.

Ft. Gaines is scheduled for full operation by 1962. It is being designed and constructed under supervision of the Mobile District, Corps of Engineers, for which Col. Harold E. Bisbort is District Engineer. Walter C. Knox is chief of the construction division of the district. And at Ft. Gaines, William R. Coryell is resident engineer for the Corps while Fremon L. Estep is chief of the foundation section.

Johnny Meagher is project manager for the contractor on the spillway and Robert Faircroft is the contractor's project engineer.

If operator inadvertently fires new Remington Captive Stud Tool into inadequate base material—



Captive Stud Guard Assembly prevents free flight of stud which is locked to tool during firing.

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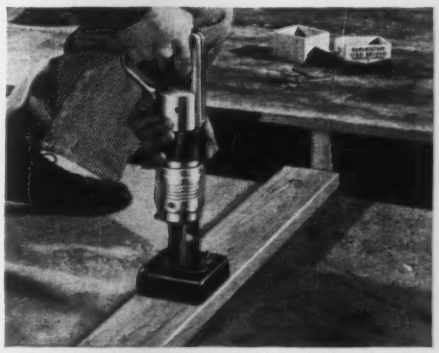

ANCHOR partition plates or furring strips to concrete or steel in *seconds* with this *new* Remington Stud Driver! You can take the tool anywhere, use it anywhere for all your light, medium and heavy-duty fastening jobs.

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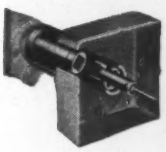

Heart of the Captive Stud Assembly is combination of square-headed piston and aluminum alloy buffer. Piston is abruptly halted by buffer when base material is inadequate to stop the stud. Remember: If it's the Remington Captive Stud tool, it's the safest Stud Driver on the market!

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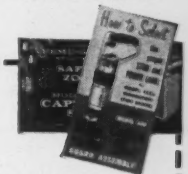

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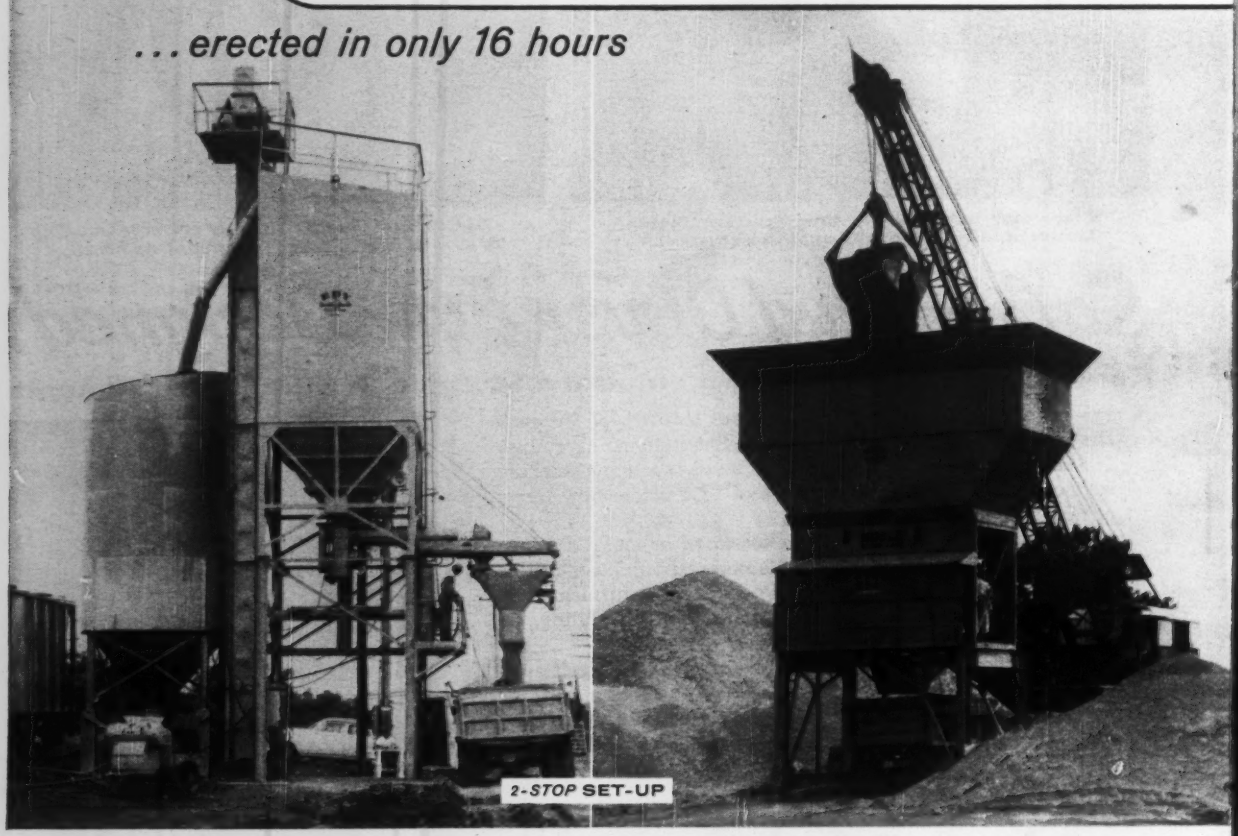

2-STOP SET-UP

Martin K. Eby Construction Co., Wichita, Kansas, required a batching plant to supply concrete for a 100,000 square yard extension of airfield runways at Rosecrans Field, St. Joseph, Missouri. Their NOBLE plant having completed a job at Wichita, Kansas, 300 miles away, was dismantled in 10 hours, transported by rail to St. Joseph, Missouri, and reassembled in only 16 hours on low-cost slab footing. The plant batches sand, aggregates and cement in a *2-stop* set-up. The cement batcher weighs, records and discharges 742 lbs. of cement in 12 second cycles. The twin aggregate batcher weighs, records and discharges 4300 lbs. of materials in 15 second cycles. Plant output is over 300 cubic yards per hour. Overhead aggregate bins are charged with a 3½ cubic yard clamshell bucket. Scales, controls, electrical system and other major components are factory installed.

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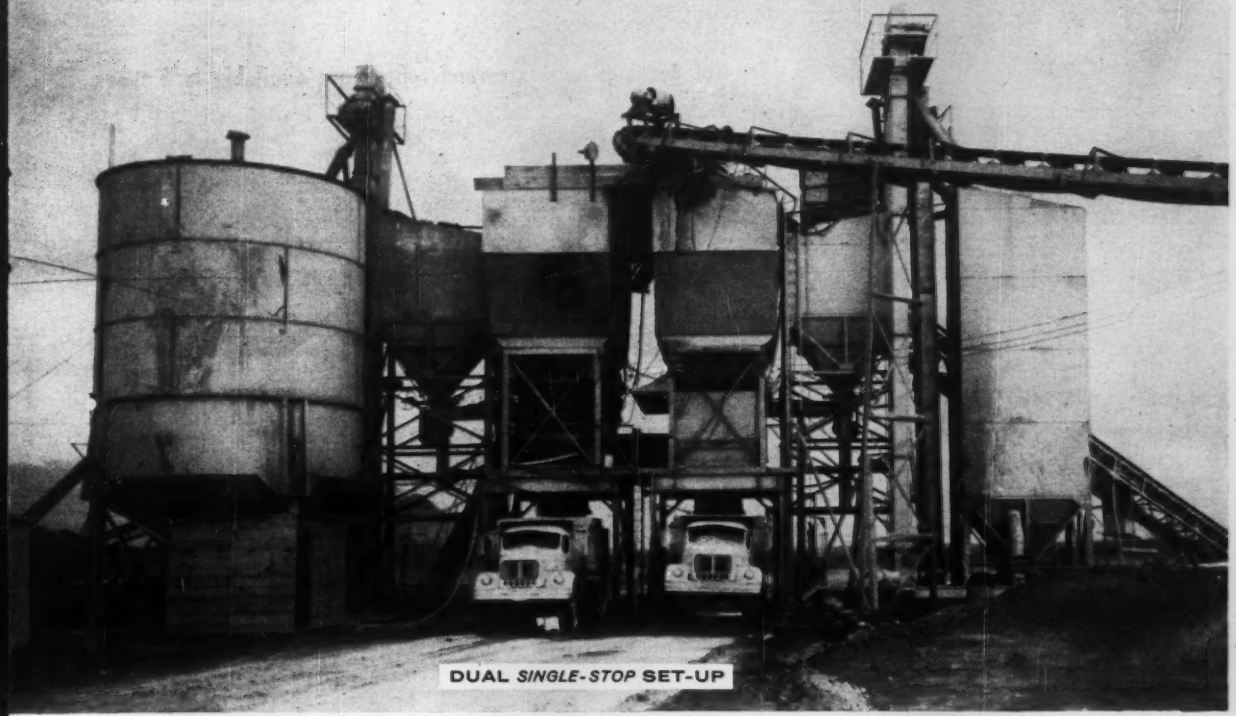

DUAL *SINGLE-STOP* SET-UP

Two NOBLE plants are batching materials for the construction of 258,000 cubic yards of portland cement concrete pavement at Mather Air Force Base, California. Operating considerably under capacity, the plants load dry batch trucks supplying 4 dual drum pavers. 3 different materials . . . 1½" rock, ¾" rock, sand . . . are stockpiled separately and supplied to both plants by three independent conveyor systems operated by one man. Each plant batches both cement and aggregates and has 150 tons of overhead aggregate storage and 375 barrels of overhead cement storage. Separate ground silos store an additional 3,600 barrels of cement. From its former location at McClellan Air Force Base, California, one of the NOBLE plants was dismantled, loaded and hauled by trucks within legal highway width to Mather Air Force Base, reassembled and put into operation all within 10 days, reports Henry J. List, Project Manager for Gordon H. Ball, Inc., general contractor.

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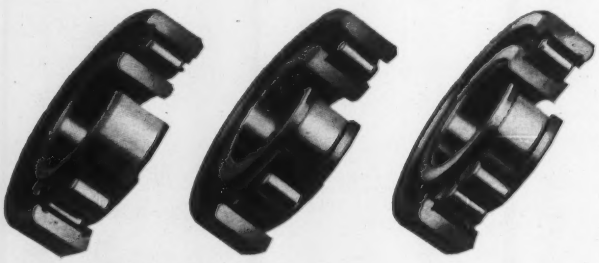
By finish grinding a carefully selected crown radius on roller ends, Rollway relieves high stress areas, insures uniform distribution of load over the entire length of the roller. Rollers can take heavier loads without excessive end-fatigue, and are less subject to the effect of slight misalignment or deflection.

The result is load rating at higher values for greater capacity, longer service life . . . or both. If this choice interests you, why not write for the complete story. Rollway Bearing Co., Inc., Syracuse, N. Y.

Tru-Rol Bearings with crowned rollers are available in 3 types

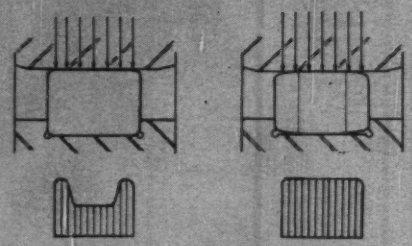


Stamped Steel Retainer with Guide Lips

Segmented Steel Retainer

Full Roller

Comparative Stress Patterns under Uniform Loads for Straight and Crowned Cylindrical Rollers



Stress pattern for a straight cylindrical roller under load. Note uneven end-loading.

Stress pattern for crowned roller under load. Crowning radius is exaggerated for clarity.

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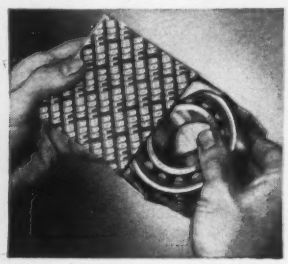

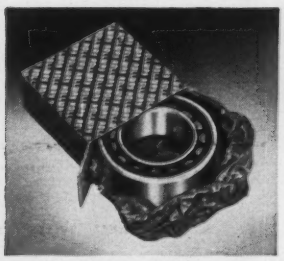

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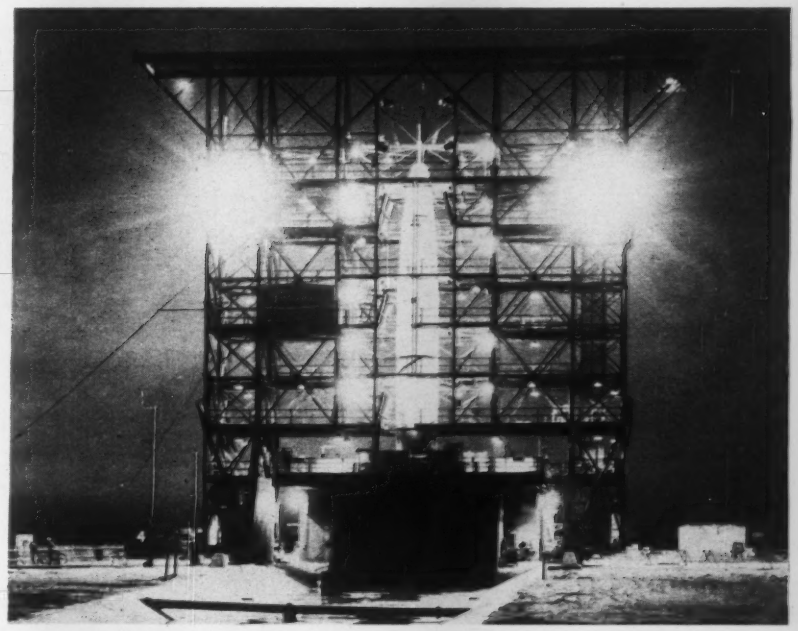
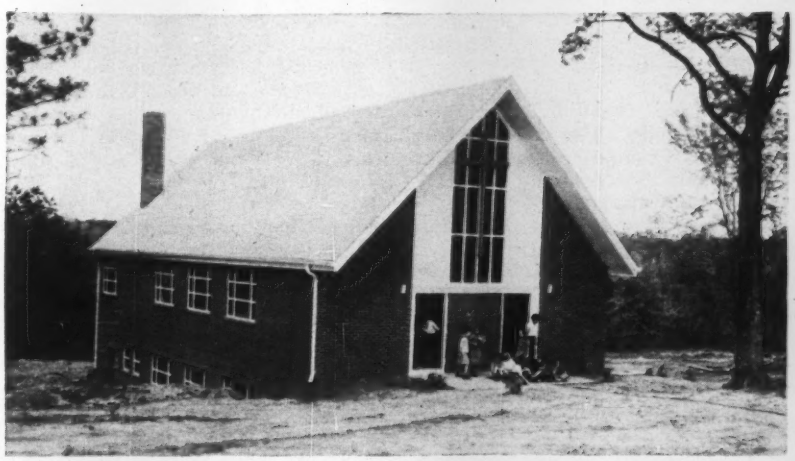
Edwin L. Jones, Sr. heads an internationally known firm that builds everything including . . .



Missile Facilities, among them some at Cape Canaveral where the Explorer was launched, and



FROM churches of small proportion, like this $35,000 structure erected near Durham, N. C., for a Methodist congregation.

TO a Skyscraper like the Life and Casualty Building in Nashville, Tenn.

J. A. Jones Builds Anything, Anywhere

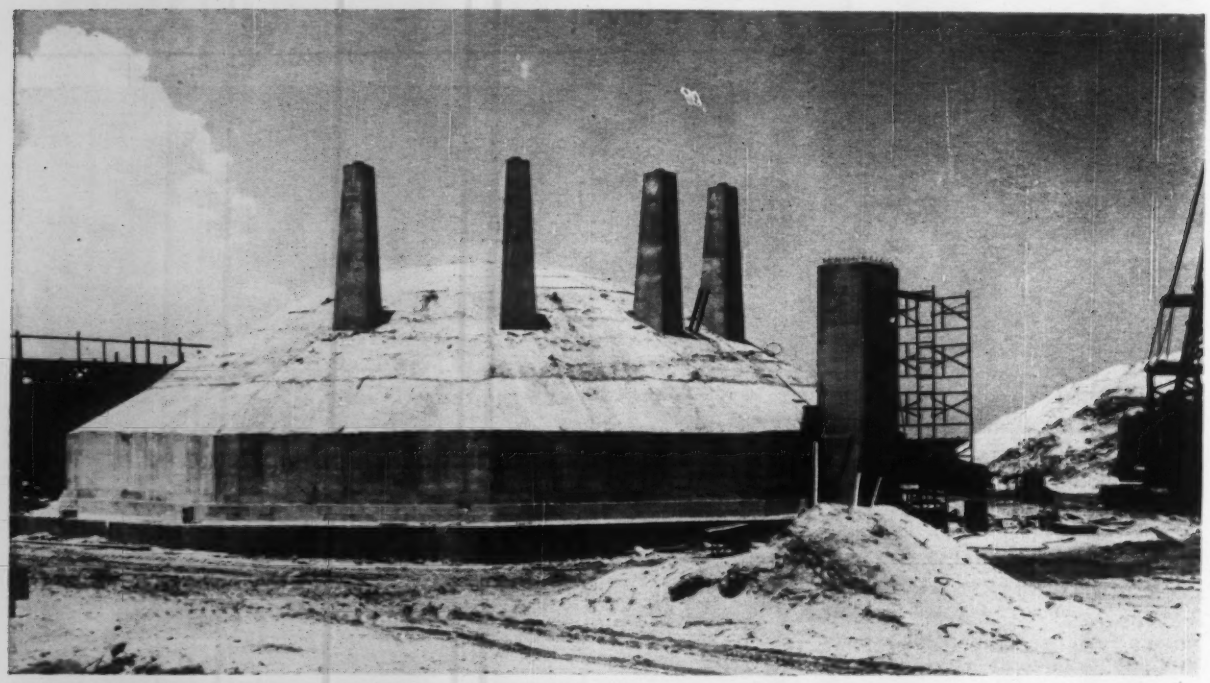
When the first U. S. satellite was launched recently from Cape Canaveral, Fla., the J. A. Jones Construction Company of Charlotte, North Carolina could react with justifiable pride. For the firm that built the gaseous diffusion plant at Oak Ridge, Tenn., also played a major role in constructing the Florida satellite launching facilities.

Furthermore, the chances are that the Jupiter C rocket (which pushed the satellite into space) was made and assembled in a Jones-built plant at Redstone Arsenal near Huntsville, Ala.

This is not surprising, for if any words could sum up the attitude of the policy makers of the Jones company those words undoubtedly would be "Someone's going to build it—so it might as well be us."

The "Jones Boys"—members of one of the largest construction firms in the world today—will in fact build anything almost anywhere. In its 62 year history the company has grown steadily from what was virtually a one-man organization to a worldwide outfit handling more than $200 million worth of all types of construction annually.

To its credit stand industrial plants, dock and harbor improvements, utilities and power plants, water and sewer systems, store, office, warehouse build-



BLOCKHOUSE WITH FOUR PERISCOPES and escape hatch is part of the missile launching facilities at Cape Canaveral where Jones was one of the prime contractors. The U. S. Satellite now encircling the globe was launched from Canaveral.

ings, housing, hotels, apartments, bridges, dams, tunnels, highways—as well as ships, railroads and refineries. The field of operations reaches to three continents, Central American and the islands of the Pacific,

Employees are often numbered in the tens of thousands. (At one time on one job, Jones had more than 40,000 men in its employ.) Even now it's a slow period when a number of employees is less than 15,000.

Yet construction men of the Hollywood type—the rough, tough, hard drinking, hard fighting, loud-swearing bullies—have no place among the top men in the Jones outfit. Almost without exception, every one of the officers and key personnel—down through foremen—are calm, quiet, soft-spoken family men whose principal outside activities involve religious and civic organizations.

• **Like father, like company**—The caliber of the men today is a direct reflection of the ideals of the company's founder, J. A. Jones, and those of his son, Edwin, now president. It has always been company policy to put as much emphasis on a man's special, human characteristics as on his ability or his construction knowhow. According to Edwin L. Jones, Jr., Vice-President (and project manager of the Cape Canaveral work), "if a man is loyal and has integrity he will learn what he has to do—and what he can't learn he'll make up for in effort."

In addition to loyalty and integrity, Jones requires versatility and adaptability of its men. The variety of jobs successfully completed is evidence enough that the organization itself is versatile and adaptable.

One of the features of the company setup of which its officers are proudest is the fact that within its key personnel can be found a specialist in practically any type of construction—and yet any one of these specialists is qualified to handle work in any number of construction fields.

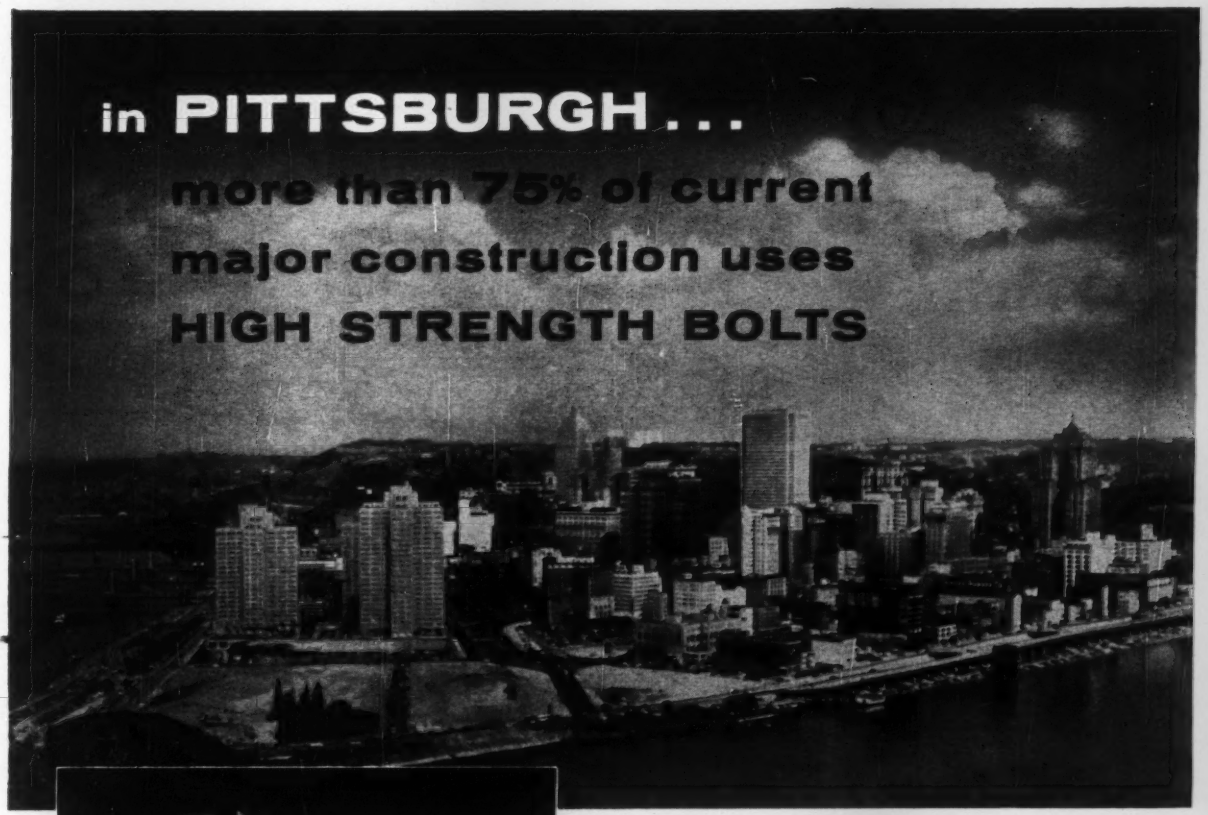
As proof of this, Edwin, (senior) cites experiences at the start of World War II in Panama City, Fla., and Brunswick, Ga. Prior to World War II, Jones had never built either a ship or a shipway, yet it was awarded a contract to construct a six-way yard at Panama City. Starting from a barren beach, the company—in less than 90 days after being ordered to proceed—constructed a city for 25,000 workmen and brought work on the ways so far along that it was possible to lay the first keel. So impressed were Navy officials that they also awarded the contract for ship construction to Jones. From this yard and from another one at Brunswick, Georgia (which was turned over to Jones for operation) were launched 212 ships within a period of months. Letters from high maritime officials as well as crewmen operating the ships attest to the high-caliber workmanship on them—and it is a proud boast that the ships turned out by Jones cost the government as much as 30% less per unit than those produced by several other shipyards.

• **Built atom bomb plant**—Another wartime achievement that greatly enhanced the reputation of the Jones Company was construction of the gaseous diffusion plant of the Atomic Bomb Project at Oak Ridge, Tenn. Here, in the remarkably short space of 20 months, Jones completed what was at the time reputed to be one of the largest construction projects ever attempted by man. The dollar value is classified, but conservative estimates set the cost of the work done by Jones at a figure in excess of one-half billion dollars.

Jones' contract included construction of a plant (consisting of two four-story units each over a mile in length), a 235 kva steam generating plant . . . first generator of which was in operation nine months after ground was broken), a fuel oil tank farm, 21 miles of railroad, 75 miles of vehicular roads, and all the utilities water and sewer systems for a city of 50,000 people.

In spite of its record of wartime construction, J. A. Jones cannot be regarded as a "war baby." Early in this nation's defense effort, prior to entry in World War II, Edwin Jones was

BOLTED CONSTRUCTION IS "GOING UP" EVERYWHERE



FAST WORK for high tensile bolts. In just five years, they're way out in front as Pittsburgh's favored technique for connecting structural steel.

Fast work for contractors, too. Compared to rivets, high strength bolts can save weeks of erection time. They also slice construction costs, require less equipment. They give greater strength, increased safety, quieter erection. No wonder they're in buildings for Duquesne and Pitt Universities, the P.R.R., the Children's and Shadyside hospitals.

RB&W . . . largest independent producer of high strength bolts for construction

And no wonder that RB&W high tensile bolts have had a large share in the outstanding success of bolted construction. Conforming to ASTM A325 standards, they provide optimum shear and tensile strength for all types of loads. They assure a structure that's permanently tied together. (And that goes for bridges and equipment, too!)

Consistent fine quality is evident in uniform threads, clean appearance, ease of assembly and tightening of RB&W high strength bolts. Send for this bulletin HS-1; and see catalog in Sweet's Industrial Construction File. Write Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.

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Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver, Fargo. **Distributors** from coast to coast.

"Completed on time"

Reinforced concrete viaduct carrying Rhode Island State Route 116, The George Washington Highway, over the Blackstone River Valley. Designed by the Rhode Island Division of Roads and Bridges.

There were no delays with REINFORCED CONCRETE

CONCRETE REINFORCING STEEL INSTITUTE
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Bridges and highway separation structures are open for traffic on time when you design in reinforced concrete. Materials and labor are *on location*—ready to start and proceed to completion. Furthermore, with reinforced concrete, necessary field changes can be made without costly delays.

Reinforced concrete is a highly flexible medium of construction. Many complicated curves can be obtained at moderate cost with simple, field-built forms. Structures of reinforced concrete are lower in first cost and require less maintenance.

Compare—you will save with Reinforced Concrete!

WACHOVIA BANK building in Charlotte, N. C. is a current Jones project.

offered a contract to build an Army camp—on the understanding that he could show a million dollar extra line of credit. Without so much as a statement in his pocket, the company president flew to New York, discussed the matter with his bankers and returned to Washington the same afternoon with a letter of credit for $1½ million extra.

The confidence evident in this case is the result of many years of conscientious building activity. James Addison Jones, the founder, was a brick-mason who grew up with the construction industry during the reconstruction period of the South, and who lived to take part in the construction of facilities demanded by the industrial revolution which took place in the South after World War I.

• **Stick to it**—J. A. Jones organized his company in 1894, and although he almost went broke on his first large job, he struggled through it by going heavily into debt and using what few personal resources he had available.

But he came out of this near-disaster with a reputation for being willing to complete a contract at any cost. And since then, that particular idea has been a part of the company philosophy—despite the fact that there have been few occasions where adherence to the policy has involved financial losses.

J. A. Jones realized early in his career that a construction company should be run on a sound and practical basis just as any other business. He set out to eliminate the hit or miss tactics so prevalent in construction at the time (and still followed by many contracting firms even today). He was assisted in

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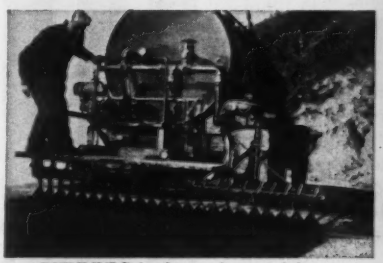

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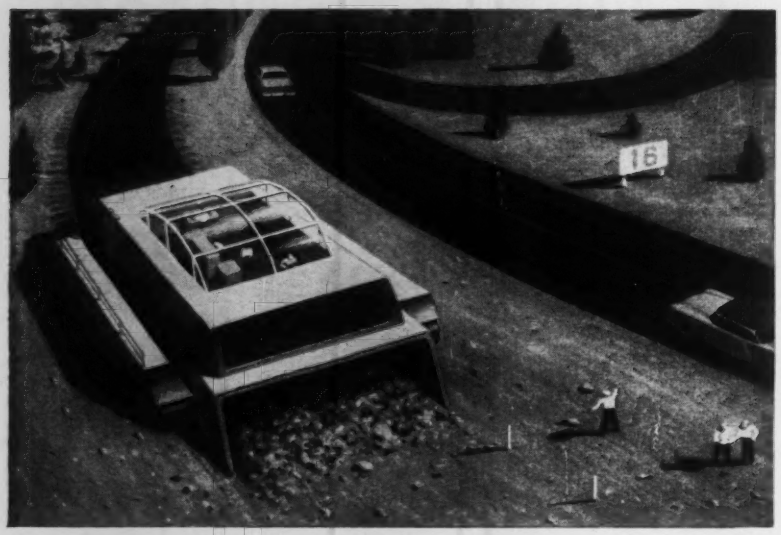


roll your own!

Speeding up our national road-building program is the goal of this design by Russ Henke of Elm Grove, Wisconsin. His behemoth of a machine literally chews up unmapped earth, compacts it with asphalt or macadam, stabilizes it, and lays a ribbon of paved road behind as it rumbles along! Crew and engineers ride in an air-conditioned cabin, and monitor the whole process by control instrumentation.

Tomorrow's *roads* may be squeezed out like toothpaste, but outstanding *ideas* for tomorrow are still produced in the old-fashioned, painstaking, human way. And only professionals know how the best in drafting tools can smooth the way from dream to practical project.

In pencils, of course, that means Mars, long the standard of professionals. Some outstanding new products have recently been added to the famous line of Mars-Technico push-button holders and leads, Lumograph pencils, and Tradition-Aquarell painting pencils. These include the Mars Pocket-Technico for field use; the efficient Mars lead sharpener and "Draftsman" pencil sharpener with the adjustable point-length feature; Mars Lumochrom, the color-drafting pencils and leads that make color-coding possible; the new Mars Non-Print pencils and leads that "drop out" your notes and sketches when drawings are reproduced.

The 2886 Mars-Lumograph drawing pencil, 19 degrees, EXEXB to 9H. The 1001 Mars-Technico push-button lead holder. 1904 Mars-Lumograph imported leads, 18 degrees, EXB to 9H. Mars-Lumochrom color-drafting pencil, 24 colors.

J.S. STAEDTLER, INC.
HACKENSACK, NEW JERSEY

at all good engineering and drawing material suppliers

this by five of his sons, the eldest of whom joined him in 1912.

The growth of the J. A. Jones Construction Company has been steady. Even during the depression, the company not only continued to show modest, but definite profits, but continued to expand. When the U.S. became involved in World War II, Jones was ready to move.

• **Keep going up**—The company, since the war, has gone on to tackle bigger jobs. Among current projects being handled solely by Jones, is a multi-million installation for American Cyanamid in Pensacola, Florida; a $16 million Capehart housing project at Fort Bragg; an $8 million stretch of highway for Ohio; a $9 million installation and Harmon Air Force Base in Newfoundland; a $4 million bank building in Charlotte, North Carolina, and an assortment of work for the military at Sitkanac in the Aleutians and on Ascension Island and Fernando Island off the West Coast of Africa, and a $20 million job at Sondrestrom Air Force Base in Greenland.

Among recent or still active jobs, handled in joint ventures, Jones can list a $19 million Palisades Dam in Idaho, the Tasloojah-Derbendi Khan Highway, the H. B. Roberts tunnel in Colorado ($48,500,000), the $43 million Derbendi Khan Dam, Iraq.

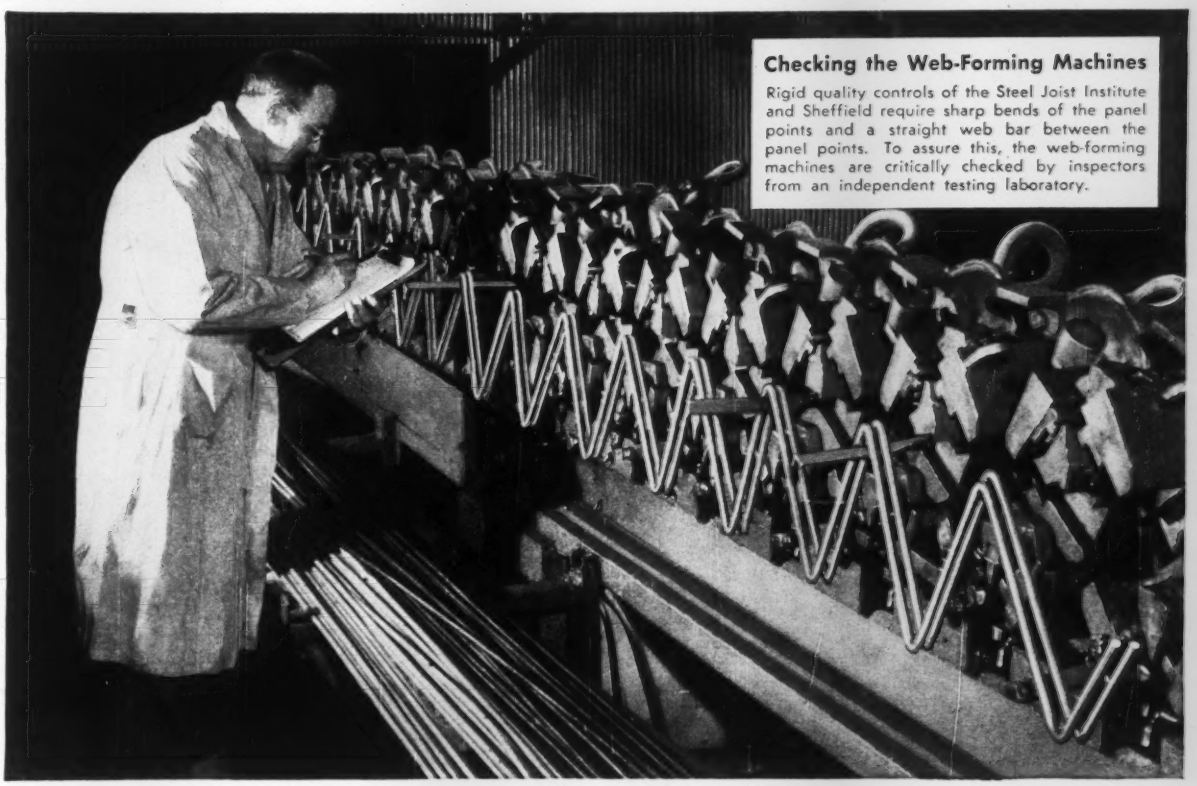
In spite of its ability to build dams in the Middle East, pipelines through the Andes, hospitals in Chile, power plants in Tennessee, the Jones Company is not so big that it will not handle a small job. "When we get too big to handle a small job, we'll be too small to handle a big one," says the company's officers. One of the firm's recent jobs was a $15,000 addition to a North Carolina parish house.

• **Safety a must**—Through all of its jobs, the company has one concern which is given great emphasis—safety. Each year the organization makes awards to superintendents who have been able to run their jobs without a lost-time accident. This year 14 of the Jones superintendents won these awards. Some of the records established are hard to believe.

On the Atomic Energy Commission job at Richmond, Washington, the firm has just completed 3,130,041 man hours without a disabling injury. Even during World War II when "hurry up" was the order of the day, records of from 1 to 3 million man hours without disabling injuries were not unusual.

Safety, according to company officials, is a full time job—and one which is often more difficult on a small job

STEEL JOIST INSTITUTE 3-WAY QUALITY CONTROL AT WORK



Checking the Web-Forming Machines

Rigid quality controls of the Steel Joist Institute and Sheffield require sharp bends of the panel points and a straight web bar between the panel points. To assure this, the web-forming machines are critically checked by inspectors from an independent testing laboratory.

Sheffield Steel Joists speed construction and cut costs in many types of buildings.

SHEFFIELD

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Open Web Steel Joists

STEEL JOIST MEMBER S.J.I. INSTITUTE

Steel Joist Institute 3-Way Quality Control

Every Sheffield Steel Joist meets the rigid requirements of the Steel Joist Institute. S.J.I. quality controls include:

1. Complete investigation of steel joist designs submitted for Institute approval.
2. Physical tests to supplement and substantiate theoretical analysis of design.
3. *A quality Verification Program* which includes inspections at fabricating level to assure that the joists produced are in accordance with approved design.

Sheffield Open Web Steel Joists are completely fabricated with most advanced precision equipment (such as the web-forming machine shown above). From it emerges continuous web members preshaped to minimize secondary stresses at panel points along the top and bottom chords. This is important to the designer since it assures him that the authentic and proved data developed by the Steel Joist Institute over a 30-year period is fully attained in the finished structural members.

Sheffield joists are adaptable to practically any type of building. They combine strength and light weight for any kind of floor or roof. This combination makes possible lighter construction of columns, walls and foundations.

Sheffield shortspan joists are made in standard sizes as established by the Steel Joist Institute to accommodate all clear spans up to 40'-0". Sheffield Longspans are available in lengths up to 96'. And all are quickly available from your nearest Sheffield location.

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an even better Wrought Iron for modern corrosion control—

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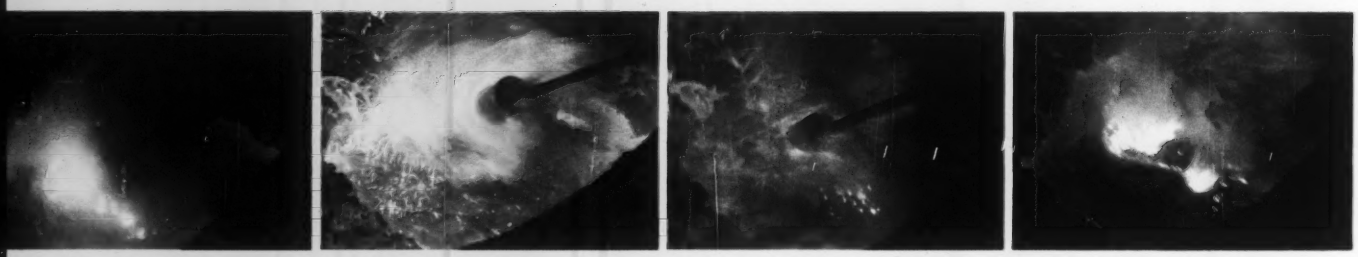

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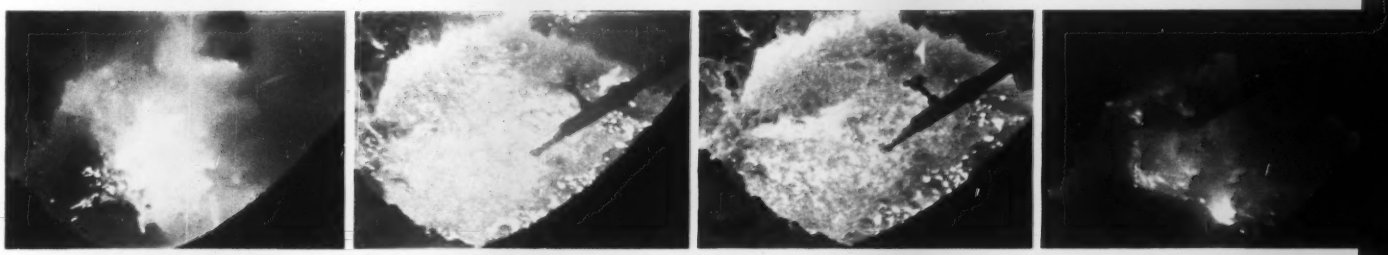
New 4-D Wrought Iron is at least 25% *more* corrosion resistant than standard wrought iron—long an industry standard for superior corrosion resistance. This significant metallurgical advance is the result of 17 years of continuing research by Byers metallurgists.

And here's what it means to you.

Seventeen year in-service and laboratory tests prove that 4-D Wrought Iron is superior not only to standard wrought iron, but has much greater corrosion resistance than other materials which are sometimes offered as substitutes. Thus, the economy of using standard wrought iron can now be compounded through the use of new 4-D Wrought Iron.

In addition to increased corrosion resistance, new 4-D Wrought Iron has

WROUGHT IRON



and new 4-D Wrought Iron is born.

greater uniformity and improved physical and mechanical properties. This is attained by substantially increasing the deoxidization of the base metal, increasing its phosphorous content, and using a more siliceous slag.

And the price of new 4-D Wrought Iron? No increase. Despite higher production costs, the price of Wrought Iron will remain the same.

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BYERS WROUGHT IRON

Increasing the deoxidization — a key step in the manufacture of new 4-D Wrought Iron.

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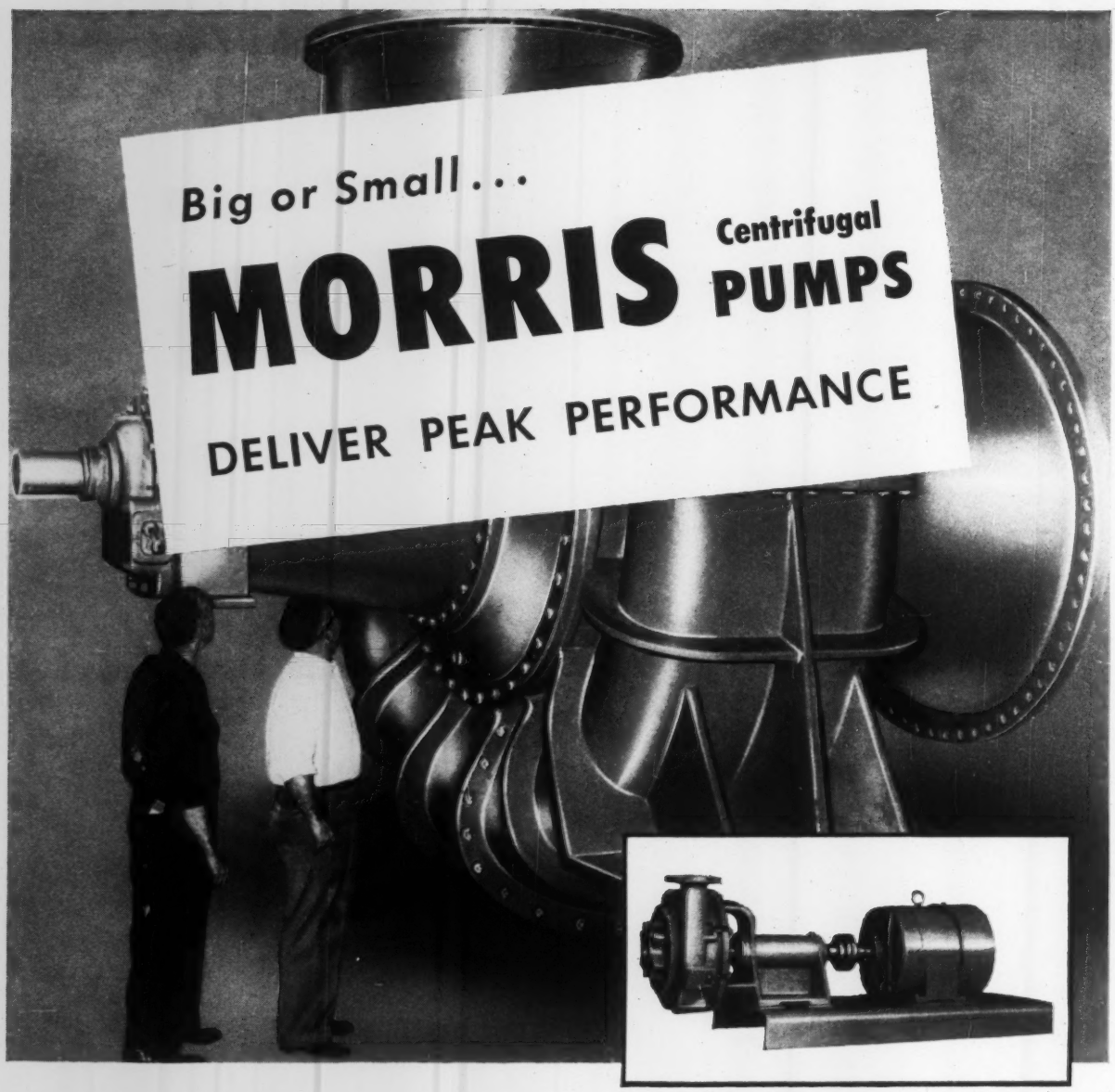

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For nearly a century, Morris Centrifugal Pumps have been a standard of performance and efficiency for American industry.

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than on a large one. But, large job or small job, the primary emphasis is on safety—and all work is under constant observation by every man, from project managers to water boys, to make sure that no hazardous conditions or procedures develop.

• **Religion—A way of life**—The company's president, although a very practical businessman, is also a man who has written many religious tracts, who has made religious speeches throughout the country, and who has devoted countless hours and many dollars in the interest of Methodism.

Although firmly devoted to his own faith, he asks of other men only that they have faiths. For in his words, "a man without faith is a man without character."

Active as he is in religious affairs, Edwin Jones has found time to be a director and former president of the Charlotte YMCA, a trustee and chairman of the Florence Crittendon Home, a trustee of the United Community Service, a Director of the Chamber of Commerce, Chairman of the Charlotte Housing Authority, Vice-Chairman of the North Carolina Turnpike Authority, and a director of several textile, hotel, and banking corporations. He is also a trustee of Duke University, Brevard College, and the Lake Junaluska Assembly.

• **Management**—Management of the Jones company consists of about 25 men. Although the main office is in Charlotte, there are nine other offices throughout the country, each headed by the vice-president.

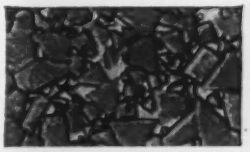
Within the U.S., however, all heavy construction except that in Pacific Northwest, is handled through the Charlotte office, where the work is divided among several sections: pipelines; bridges, dams, harbors; structural; power plants; mechanical, and marine. There is also a section devoted to railroads, highways and utilities.

The average age of the men heading these sections is between 45 and 50, and they are backed up by an excellent staff of men all between 30 and 40 years of age.

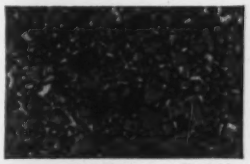
All work in the Pacific Northwest, regardless of its nature, is handled by the Seattle office. All other branch offices, however, are limited to building construction, and each one functions as a small construction company except that it has all the advantages of big company backing.

For behind each branch office stands the entire Jones organization with all its abilities in planning, financing, purchasing and engineering.

Longer bit life—with *new* Sandvik Coromant Bits



Sandvik Coromant Tungsten Carbide. (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities—therefore stronger, longer-lived.



Low quality Tungsten Carbide. (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

NEXT time you buy bits, specify Sandvik Coromant because they give you more footage per bit, lower drilling costs. Here's why:

1 Only first-quality tungsten carbide is used—as shown in the microphotos above. This means less wear, longer life and a better job.

2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.

3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling.

No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

THESE STANDARD SIZES ARE AVAILABLE

	THREAD	DIAMETERS AVAILABLE (IN INCHES)													
SHOULDER TYPE	⅞" F	1½													
	1" H	1½	1⅝	1¾	1⅞										
	1 3/16" D					2	2⅛	2¼	2⅜	2½	2¾	3			
	1 11/16" K											3	3½	4	4½
BOTTOMING TYPE	1¼" Rope				1⅞	2		2¼		2½					
	1½" Rope									2½	2¾	3	3½	4	
	2" Rope												3½	4	4½	5
	400					2		2¼		2½					
	600									2½	2¾	3	3½		

Shaded area indicates X-Bits

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels—the most widely used in the world—and Sandvik Coromant extension steel equipment.

Write, phone or cable today for further details to any of the addresses below:

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ATLAS COPCO CANADA *Montreal Airport, Quebec. Phone Melrose 1-5571*
ATLAS COPCO MEXICANA *Apartado Postal 56, Torreón, Coahuila. Phone 39-07* DST.78

Defects in Building

Court Limits Damages For Defective Work

Where defects in a building result from the work of a subcontractor and the subcontractor is willing to correct the defects, the prime contractor is not justified in demolishing the building and in charging the subcontractor the cost of rebuilding it.

This was the ruling of a Louisiana court. Facts were these.

The owner of a building employed a contractor to make certain improvements in it and the contractor employed a subcontractor to perform part of the work. The prime contract called for the jacking up of the building and the construction of a structure beneath the building that would be suitable for store purposes. The agreed price for the work was $15,375 which was to be paid in five installments of $3,075.

After the subcontractor had raised the building and had placed jacks under it which was the part of the work that he was to perform, the general contractor proceeded to build the lower concrete wall on which the remodeled building was to rest. On completion of this part of the work, the general contractor was paid the first installment of $3,075, and he directed the subcontractor to lower the house so that it would rest on the new walls.

While the subcontractor was engaged in the operation of lowering the building, the house moved forward and the front part of the house fell because of the failure of the jacks. Attempts were made to settle the obligations arising out of the accident without any success and even though the subcontractor offered to reraise the house and repair the defects, he was not permitted to do so and the general contractor demolished the building and sold the salvaged material for $50. The owner then brought an action against the general contractor and its surety and the subcontractor to recover as damages the sum of $31,420, plus attorney's fees and penalties.

The general contractor and its surety interposed the defense that the damages that the owner sought to recover resulted solely from the defective manner in which the work was performed by the subcontractor. The court granted the owner a judgment against the general contractor for the sum of $6,075.24 and one in favor of the general contractor against the subcontractor for the same amount, less the $50 that the general contractor received for the salvaged materials. The general contractor, its surety and the subcontractor appealed from the judgment of the trial court, but the owner did not appeal.

The appellate court[1] held that the evidence produced at the trial showed that the subcontractor was willing to reraise the house and the defects in the house could have been remedied for a small amount but the general contractor prevented him from doing this and proceeded to demolish the building. Under such circumstances, the appellate court held, the subcontractor was liable only for what it would have cost to carry out and complete his subcontract, plus any damage done to the concrete walls. The court fixed this amount at $1,500 and reduced the judgment against the subcontractor from $6,057.25 to $1,500.

(1) Macaluso v. Thibodeaux, 94 So. 2d 426, Supreme Court of Louisiana, Feb. 25, 1957.

Decision of Arbitrator Is Final and Conclusive

An arbitrator's decision under an arbitration clause in a construction contract is generally conclusive and not subject to appeal unless fraud or bad faith can be established.

In an Ohio dispute, for example, Peter Kiewit Sons' Co. was general contractor and subcontracted part of the work to Dressler Gas & Appliance Company. A dispute arose between the parties as to whether some of the work that the subcontractor was directed to perform was covered by the contract.

The contract provided that all disputes arising under the contract would be determined by arbitration. The subcontractor asked for arbitration of the dispute. The matter was submitted to arbitration and the arbitrator decided against the subcontractor, holding that the work that it was requested to do was covered by the contract.

The subcontractor appealed to the court to determine if it was bound by the decision of the arbitrator and if it could bring suit at law for the extra work. The lower court held that the subcontractor was not bound by the determination of the arbitrator. This judgment was reversed when the case was appealed.[1]

The appellate court referred to an Ohio case,[2] where the court stated that the law in Ohio is as follows:

"1. It is the policy of the law to favor and encourage arbitration, and every reasonable intendment will be indulged to give effect to such proceedings and to favor the regularity and integrity of the arbitrator's acts.

"2. Where a matter is submitted to an arbitrator for decision, with an agreement that the arbitrator's decision shall be binding upon all the persons involved, such persons are bound by such decision provided there is no fraud or bad faith on the part of the arbitrator and he acts according to the instructions given him."

(1) Dressler v. Peter Kiewit Sons' Co., 144 N.E. 2d 269, Court of Appeals of Ohio, Jan. 8, 1957.

(2) Brennan v. Brennan, 164 Ohio St. 29, 128 N.E. 2d 89, 90.

Acceptance of a Check Held Bar to Later Claim

Where there is a dispute as to the amount owed a contractor, and the contractor accepts a check sent by the owner in full payment of the amount due, acceptance of the check is an accord and satisfaction. The contractor cannot sue later for an additional amount.

In a New York case, for example, there was a dispute between the owner of a building and a contractor as to the amount due the contractor.

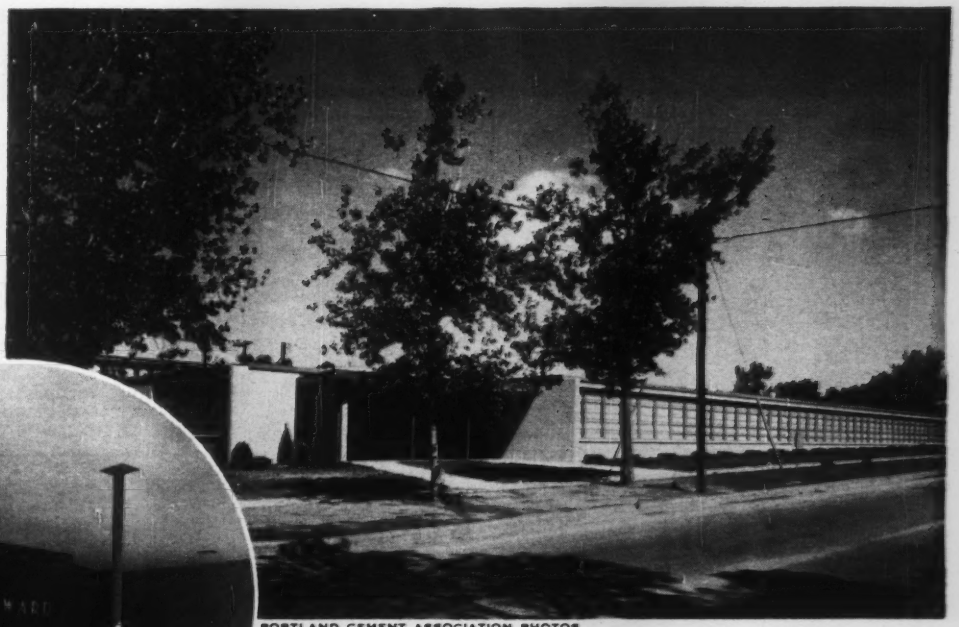
The owner sent the contractor a check for the amount it believed was due the contractor and a notation was made on the back of the check that the payment was in full settlement of all claims of the contractor. The contractor had the check certified and, before depositing it, struck out the statement that the check was in full settlement of all claims.

The contractor later brought an action to recover a balance he claimed was due him for work performed. The owner interposed the defense that there was an accord and satisfaction and asked that the contractor's action be dismissed which application was granted.[1]

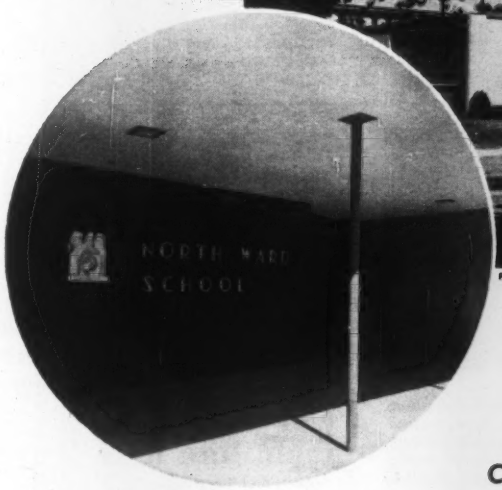
The striking of the condition by the plaintiff (contractor) subsequent to the certification, since the amount of the debt was in dispute, did not operate as a bar to the discharge of the obligation.

(1) Roberg v. Evyan, Inc., 163 N.Y.S. 2d 729, N. Y. Supreme Court, N. Y. County, May 14, 1957.

These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.



North Ward School



PORTLAND CEMENT ASSOCIATION PHOTOS

For Low Cost Beauty

Architectural Concrete and Concrete Masonry made with Ideal Cement provide a BEST BUY for Schools

An economical dual application of concrete was developed for the construction of the North Ward Elementary School in Superior, Nebraska. On both the inside and outside of this handsome school building, concrete walls were left exposed.

Architectural concrete exterior walls provide an attractive, low-annual-cost exterior treatment for the entire building. On the inside, lightweight concrete masonry walls fulfill a load-bearing as well as a decorative purpose. The interior ceiling was constructed of exposed concrete filler-blocks to provide additional economies when used with the thin concrete roof slab.

This unique school building provides a total of 22,750 sq. ft. of space at a cost of $11.33 per sq. ft.—is an outstanding example of the way architectural concrete and concrete masonry provide beauty, economy, and long life with minimum maintenance. Ideal Cement was used exclusively for all concrete and concrete masonry units in North Ward Elementary School.

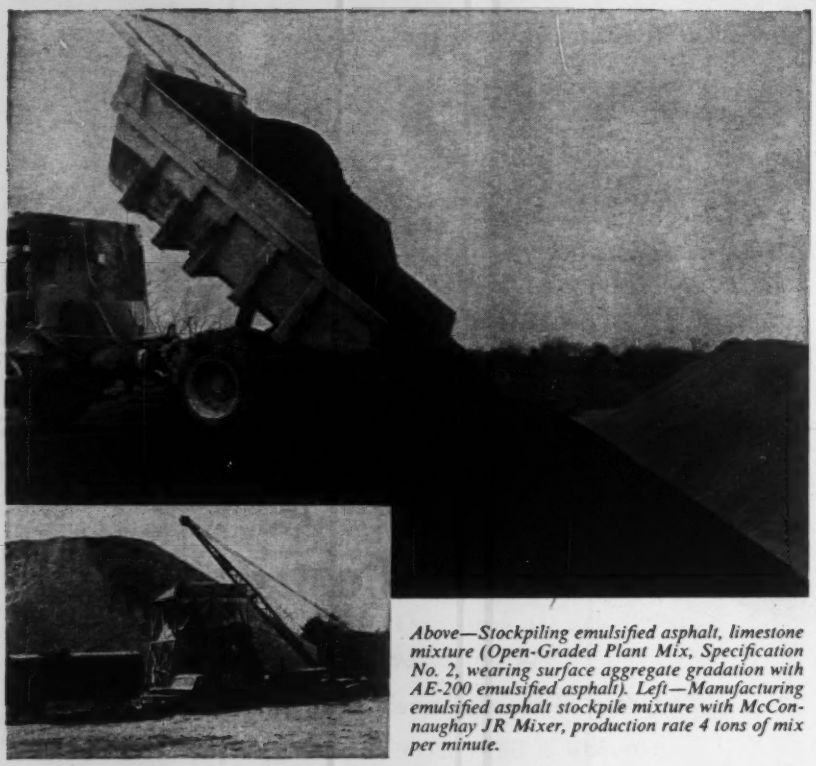
PORTLAND IDEAL CEMENT

IDEAL CEMENT COMPANY

DENVER, COLORADO

15 Plants and 4 Terminals Serving
Some of the Most Rapidly Growing Areas of the Nation

McConnaughay EMULSIFIED ASPHALT PLANT MIX



Above—Stockpiling emulsified asphalt, limestone mixture (Open-Graded Plant Mix, Specification No. 2, wearing surface aggregate gradation with AE-200 emulsified asphalt). Left—Manufacturing emulsified asphalt stockpile mixture with McConnaughay JR Mixer, production rate 4 tons of mix per minute.

For Stock-Piling or Immediate Use On Any Paving or Patching Job

With McConnaughay Emulsified Asphalts and either damp or dry aggregates, these mixtures may be prepared either hot or cold. They may be either open-graded or dense-graded types...with the use of limestone, slag, trap rock, gravel, shell, sand, or any combinations of these materials.

The same mixtures may be made cold for stock-piling or immediate use in extensive paving or smaller maintenance jobs. In either case, they are highly resistant to water during the preparation and after application. Proper selection of aggregates and Emulsions also gives you assurance that stock-pile mixtures will remain fully workable for long periods... up to twelve months.

McConnaughay Licensees are fully equipped to take on complete contracts or provide the laboratory facilities, Emulsions and technical services required on any job. If you are figuring on road, street, or general paving, get in touch with the nearest McConnaughay Licensee (list at right) or contact main office.

SPECIFICATIONS OF THESE EMULSIFIED ASPHALT PROCESSES SENT ON REQUEST

1-Penetration Macadam, 2-Open-Graded Plant Mix, 3-Open-Graded Road Mix, 4-Dense-Graded Plant Mix, 5-Dense-Graded Road Mix, 6-Mat Coat, 7-Seal Coat, 8-Sand Mix, 9-Sand Honing, 10-Patching, 11-Mastic-Mix, 12-Driveway Construction.

McCONNAUGHAY LICENSEES Operating K. E. McConnaughay Emulsified Asphalt Plants

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E. A. Mariani—Emulsified Asphalt
Hooker's Point, Tampa

ILLINOIS
Emulsions, Inc.—*Lawrenceville*

INDIANA
Bituminous Materials Co.
P. O. Box 1140, *Terre Haute*
Wabash Valley Asphalt Co.
Terre Haute
Walsh & Kelly
R. R. No. 2, *Gary*
Brookman Construction Co.
17th & Gharkey Sts., *Muncie*
Fauber Construction Co.
Lafayette
Asphalt Materials & Construction, Inc.
960 East 22nd, *Indianapolis 2*

IOWA
Bituminous Materials & Supply Co.
409 Fifth Street, *West Des Moines*
Plants: *Spirit Lake, LeMars, Carroll, Algona, Lehigh, Davenport*

KENTUCKY
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Doherty and Swearingen Co.
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MASSACHUSETTS
James Huggins & Sons, Inc.
Medford & Commercial, *Malden 48*

MICHIGAN
Bituminous Materials Co.
318 Atlantic St., *Bay City*
Bituminous Materials Co. *Escanaba*
Bituminous Materials Co.
416 S. Water St., *Jackson*

NEW YORK
Knight Paving Products, Inc.
1655 Union Rd., *Gardenville*
Knight Paving Products, Inc.
Vine Street, *Ithaca*
Knight Paving Products, Inc.
1980 East Avenue, *Rochester 10*
Knight-Bitumen Corp.—*Watertown*
Albany Asphalt & Aggregates
75 State St., *Albany*
Bimasco, Inc. *(2 plants)*
312 Brook Street
Bayshore, L. I., N. Y.

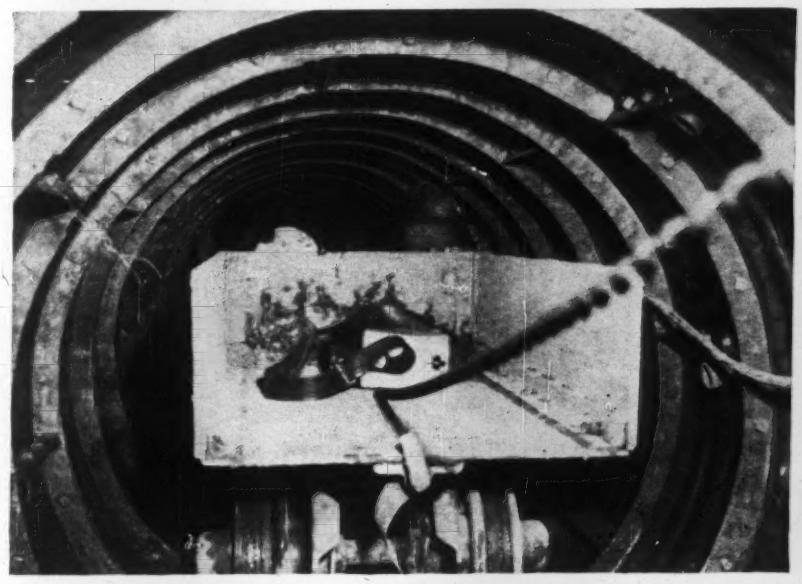
SOUTH CAROLINA
Seaco, Incorporated
2700 Industrial Drive, *Columbia*

TENNESSEE
Asphalt Products Co., Inc.
Powell Ave., *Nashville 4*

CANADA
T. J. Pounder & Co., Ltd.
1474 Wall St., *Winnipeg, Man.*

Eastern Representative:
John A. Dow
157 Church St., *New Haven 10, Conn.*

K. E. McCONNAUGHAY LAFAYETTE INDIANA
EMULSIFIED ASPHALT *PLANTS AND PROCESSES*



CRAMPED INTERIOR of tunnel indicates why short men worked the job. Gadget in miniature muck car is a gas detector.

Small Men and Machines Drive 42 in. Tunnel

Driving 1,100 ft of 42 in. tunnel, believed to be the world's smallest, was no mean trick even after special equipment and procedures were devised.

This unusual job arose when the Oahe reservoir site on the Missouri River had to be tapped for a water supply to the nearby town of Mobridge, S. D. Construction of the big dam made the city's existing Missouri River intake unusable, so the Corps of Engineers had to design a new intake that would function during the construction period (direct from the Missouri) and when Oahe reservoir fills.

The scheme called for a 113 ft deep shaft on high ground, a horizontal 20 in. dia pipe from the shaft bottom 1,000 ft into the river, and another 20 in. pipe, 40 ft higher on the shaft, extending 450 ft into the reservoir. Big problem was that the steep-sided hill rising from the flood plain allowed only 450 ft of riverward end of the lower pipe to be constructed by cut and cover methods. All the remaining line had to be tunneled through soft and tricky Pierre shale.

The contractor, Whittle Contracting Co., Dallas, decided that a 42 in. bore was the smallest that should be attempted. It built a ¼ cu yd muck car that rode on rails—the type used for kiddie railroads. A spade bit activated by an air-driven jackhammer was used to work the face while a 3,200 cfm compressor supplied air for ventilation.

As excavation progressed, liner plates were bolted into place in 18 in. sections.

Three men—picked for their short stature—rotated the tunneling tasks. One man handled the air-hammer. Another mucked, loading the car with an extra-short-handled shovel. The third man tended the compressor outside. Work continued around the clock in three shifts. Advances of 14 ft per day in the upper bore and 8 ft in the lower section were achieved.

Spaces behind the liner plates were sealed with grout. Then, 20 ft lengths of 20 in. pipe were blocked in place and the annular space between pipe and liner plate was concreted.

Whittle also built a novel slip form to line the 17 and 25 ft dia shaft. It carried two platforms. One was a trailing platform that enabled workers to finish off the concrete. The other, level with the top edge of the form, permitted workmen to place reinforcing steel and concrete as the form lifted. The form surrounded a center tower set in the shaft and was rigged for hoisting. Concrete was placed in buggies and reinforcing steel was handled in a frame; both frame and buggies were job-built to fit the job. Eight hydraulic jacks lifted the form 8 in. per hour.

(F&O continued on page 64)

WELDED or RIVETED
STEEL PLATE FABRICATION

★ Boiler Casings
★ Boiler Breechings
★ Flues and Ducts
★ Condenser Shells
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★ Wind Tunnels
★ Crane Bridge Girders
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★ Roll-Over Fixtures
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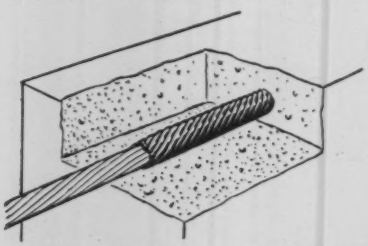

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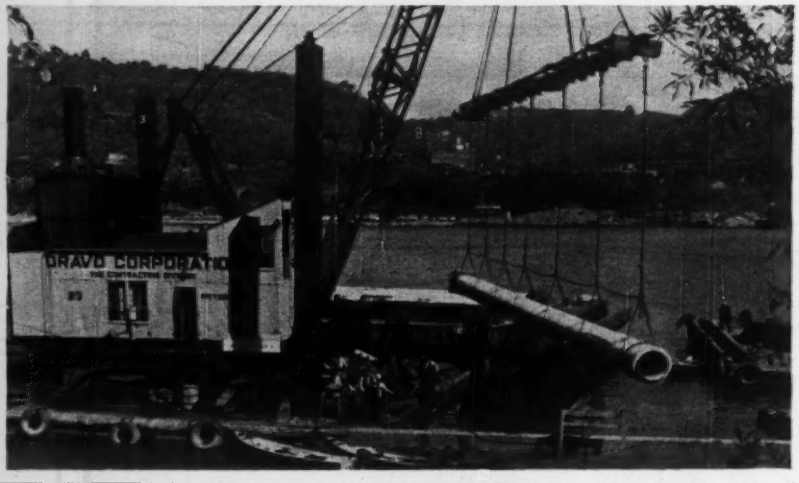


Seven-sling rig lowers pre-assembled lengths that . . .

Cut Underwater Joining Time

To keep time-consuming underwater connections to a minimum, partial pre-assembly was employed on 30 in. dia reinforced concrete pipe for a 1,100 ft interceptor sewer across the Allegheny River, six miles above Pittsburgh's Point, Pa.

What the builders did was to take sixty 16-ft-long sections of pipe and make them up into 96 ft lengths before sinking. Some of the 6-section lengths were assembled in the hopper barge that delivered them and others were made up on deck barges.

A derrickboat, utilizing a special rig with seven wire rope slings, lowered the 30 ton lengths to a trench that lay as deep as 28 ft below the surface of the river. A diver then went down and telephoning instructions, had the pipe jockeyed into position with the aid of another derrickboat.

To hold the pipe in place while a dredge backfilled the trench, a cable from a pile driven at the river end of the pipe was looped around it.

The river crossing was made by Dravo Corp., Pittsburgh, for the Allegheny County Sanitary Authority as part of its $80 million sewage disposal system. Pipe was cast by Allegheny Concrete Pipe Associates.

Pontooned Trencher Wades Through Muck

The marshlands of Cameron Parish, La., made conventional trench digging methods impossible, so United Gas Co.'s engineers equipped this Cleveland trencher with special pontoons to dig a pipeline.

The amphibious trencher, hooked up with a "marsh buggy" to aid forward movement, did a good job of digging its way through the swamplands, despite the shallow water covering much of the right-of-way.

Push-loading for Jack Kleck Agricultural Tillage Service, Inc., Phoenix, Arizona, Tournatractor can load 12-yd. scraper every 77 seconds, including time for positioning, pushing, boosting out-of-cut, and return. Niel Kleck reports, "Tournatractor pushes out more loads for us!"

RUBBER-TIRED PUSHER

averages 35 sec. for 12-yard push-loads

In arid Arizona, where a little water has to go a long way, a common method of water conservation is agricultural land-leveling. Cutting highs, filling lows on farms, keeps scarce rain and irrigation water flowing evenly, avoids wasteful pools.

Among the firms engaged in this work is the Jack Kleck Agricultural Tillage Service, Inc., Phoenix. With a fleet of tractor-drawn scrapers and two LeTourneau-Westinghouse Tournatractors® for high-speed push-loading, the company has leveled hundreds of farms.

Time studies on one recent job — moving 123,000 cu. yds. of sandy loam to level two adjoining fields totalling 220 acres — indicate why the firm is enthusiastic about rubber-tired Tournatractor as a pusher.

Cuts time loading . . . speeds entire cycle

Tournatractor's average times on all parts of the load cycle were fast. Positioning for the push took just 13 seconds. Push-loading for big heaped 12-yard payloads averaged only 35 seconds. The big 210 hp pusher used an average of an extra 5½ seconds to give the tractor and scraper a high-speed boost out of the cut . . . then, in high reverse, roared back in 23½ seconds to its position for the next load.

Even with the boost to get the scraper team into high-speed haul fast, time studies showed Tournatractor could maintain loading schedules on a 77 second cycle.

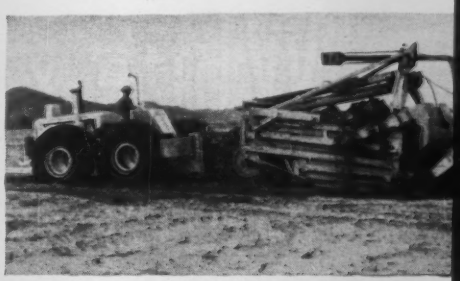
Niel Kleck says, "Tournatractor is more maneuverable and gets around faster. It just pushes out more loads."

Superintendent Abe Galaviz agrees. He says: "You move around fast with Tournatractor. I wouldn't trade it for 2 crawlers on this work."

Likes "go-anywhere" ability

Big volume pushing ability is only one of the reasons Tournatractor is popular with the firm. Kleck also says that "there's no comparison between tire and track maintenance costs." He reports that when jobs are 30 miles apart or less, Tournatractor is sent to the job under its own power, and on his type of land-leveling work this is a most important saving in costly time.

Quick maneuvering, fast traveling, go-anywhere Tournatractor belongs in *your* equipment spread. Competitive in price with other tractors in its power class, it can get places faster, do more jobs for you faster. Contact your LeTourneau-Westinghouse Distributor for full details and a working demonstration.



Tournatractor's fast, easy maneuverability pleases operator Joe Foreman, who says: "I've operated all sizes of crawlers, and I like Tournatractor better than any of them. It's more maneuverable, and gets around better than the handiest crawler."

CT-1522-DCJ-1

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Three Alternates on Bridge Bids

Bid on alternate of prestressed I-section stringers and concrete deck wins contract for three N. J. bridges

A $1,517,642 contract to Brann & Stuart, Inc., Trenton, N. J., awarded by the New Jersey State Highway Department, is for three, prestressed concrete highway bridges across Manahawkin Bay between Hilliard and Ship Bottom. The bridges are 467 ft, 360 ft and 477 ft, respectively, in length, for a total of 1,304 lin ft. Average cost is $1,163.83 per lin ft.

Each bridge will have a 60 ft roadway and two 3 ft safety walks. Spans are 40 ft spans and are supported on creosoted timber-pile bents.

Bids were received on these three alternate types of deck construction:

Alt. A, steel stringers and concrete slab.

Alt. B, prestressed concrete I-section stringers and concrete deck, for which the contract was awarded.

Alt. C, prestressed concrete box sections and asphalt pavement.

The engineers are O. S. Fritzsche, state highway engineer, and L. C. Peterson, chief bridge engineer.

The contractor furnishes all materials. Rail, truck and water transportation are available. Railhead is 10 miles from the project.

Minimum wages set for this job include: Skilled labor, $1.75; semi-skilled, $1.25; common labor, $1.00.

Here are the low bids on each of the three alternates:

Alt. A Ole Hansen & Sons, Inc., Pleasantville, N.J. $1,569,954
Alt. B Brann & Stuart, Trenton, N.J. 1,517,642
Alt. C F. A. Canuso Sons, Inc., Phila., Pa..... 1,888,144

Bids: 11-7-57 Items	Unit	Alternate A Quantity	Alternate A Unit Price 1	Alternate B Quantity	Alternate B Unit Price 1C	Alternate C Quantity	Alternate C Unit Price 1
Excavation, foundation	cy	513	$1.50	513	$4.62	513	$3.25
Concrete in structs, C1 B	cy	4,323	89.00	4,336	82.20	2,288	100.00
C	cy	1,038	48.00	1,031	59.60	1,052	38.00
parapet	lf	2,751	11.00	2,751	8.32	2,751	10.50
Piles, treated timber bents	lf	43,680	4.35	47,040	4.27	57,120	5.35
conc, cast in place	lf	12,600	6.00	12,600	6.78	12,600	7.10
Steel, reinf, in structs	lb	878,115	0.14	902,795	0.1367	337,765	0.135
structural	lb	1,873,910	0.157	485,065	0.206	712,060	0.312
Shear connectors	ls	job	22,339	job	3,000	job	3,000
Conduit system, compl	ls	job	11,672	job	8,500	job	8,500
& navigation lighting system, compl	ls	job	10,101	job	8,750	job	8,750
Railing, metal	lf	2,596	11.50	2,596	10.85	2,596	12.35
Treated timber structs, fenders	Mbm	16	1,100	16	689.50	16	1,000
bulkheads	Mbm	30.1	740.00	30.1	526.20	30.1	675.00
piles, fenders	lf	8,300	4.25	8,300	3.64	8,300	3.50
bulkheads	lf	13,130	2.80	13,130	3.60	13,130	3.50
sheeting	sf	45,610	3.00	45,610	2.51	45,610	3.75
Tie rods, galv WI	lf	88,190	0.55	88,190	0.45	88,190	0.68
Conc, prestressed, stringers	ls	.....	.....	job	221,500	.....	.....
box sect	ls	.....	.....	.....	.....	job	466,500
Pavement, tp FA-BC2, variable thickness	t	.....	.....	.....	.....	1,751	12.00
Field office	ls	job	1,000	job	2,000	job	2,500
Excavation, borrow	cy	57,431	0.86	57,431	0.60	57,431	0.72

Completion: 8-15-58
Liquidated damages: 0.02% of total price bid per calendar day

Interstate Road Bid at $149,417 Per Mile

Fourteen contractors bid for the 12.197 mile concrete slab highway for North Dakota Interstate Route No. 1, east of Jamestown. It calls for two 24 ft lanes of 10 in. uniform unreinforced concrete slab—two 12-ft lanes on each roadway—plus a three-in. sand cushion.

Awarded by the North Dakota State Highway Department, the contract at $1,822,445 (an average of $28.30 per lin ft) went to Swanson Construction Co., St. Paul, Minn. This was 2.2% below the second and 20.4% below the high bid. Erling Henickson is construction engineer.

Class A concrete is 3500 psi in 28 days, 5.5 sacks per cu yd.

Minimum wages range from $1.35 for common labor through $1.50 for semi-skilled to $2.20 for skilled workers.

The contractor furnishes all materials.

Here is how the fourteen bids went:

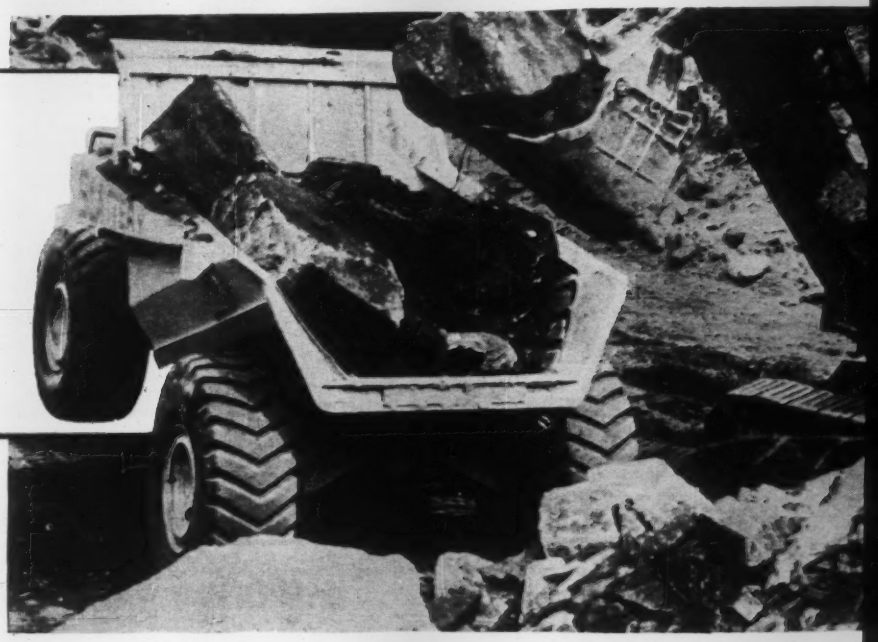
1C O. W. Swanson Constr. Co., St. Paul, Minn. $1,822,445
2 Northern Impr. Co., Schultz & Lindsay Constr. Co., Fargo, N.D. 1,862,598
14 Haggert Constr. Co., Fargo, N.D. 2,289,131

Bids: 12-20-57 Items	Unit	Quantity	Unit Prices 1C	Unit Prices 2
Subgrade preparation, tp C	sy	354,775.2	$0.04	$0.08
Conc pav, air entrained	sy	354,775.2	2.92	2.92
Cement, Portland, air entr tp 1A or 1S-A	bbl	136,734	5.29	5.40
Subbase Cl A, sand	t	62,143	0.75	0.92
Water for compaction	Mgal	1,190	2.00	2.30

Completion schedule: 125 10-hr working days
Liquidated damages: $90/cal day

Load-out more per shovel

In the loading zone, Tournapull® Rear-Dumps reduce shovel waiting, cut load-time . . . handle more loads per day



You'll load-out more per day, when your shovels load into Le-Tourneau-Westinghouse Tournapull Rear-Dumps. These husky haulers speed your load-haul-dump-return cycle in many ways. Here's how Tournapulls boost output by saving time *in the loading zone.*

Faster spotting at shovel

Rear-Dump eliminates slow back-and-forth maneuvering to spot, while your shovel sits idle and waiting. Tournapull operator can swing prime-mover 90° . . . make sharp turns to maneuver quickly into best loading position. Tournapull's quick maneuverability adds time for extra payloads . . . saves preparation of turn-arounds . . . shortens cycle.

Turns 180° in tight quarters

With 90°-turn, geared electric-steer on kingpin, your Tournapull operator can make fast, tight U-turns at the shovel . . . in dead-end cuts, in narrow pits, in tunnels, on restricted benches. This frequently saves long, slow back-in . . . eliminates delays for shuttling into tight positions. A 22-ton model "C", for example, can turn 180° to spot in a dead-end cut less than 21′ wide. All L-W haulers make continuous U-turns in less than their own length. And with body "up", they can turn 180° in 25% less than their length.

Big, easier-loading bowl

Rear-Dump's broad bowl is an easy-to-hit target — one that lets your shovel operator spot dipper fast, for quick dump without spillage. He swings the bucket thru bowl's low rear entry in a smooth, continuous arc . . . there's no time wasted on jerky up-down-up-and-out motions.

Exclusive . . . Tournapull steering

Only Tournapulls give you geared, electric-powered, 90° kingpin steer. At touch of a dashboard switch (or movement of steering wheel on 35-ton unit), an electric motor pivots prime-mover on the king-pin. Safety limit switch stops turn at 90° angle.

The rugged triple-strong body is so tapered that it takes shock loads easily, quickly builds a protective bottom load cushion. Because long drive-shaft is eliminated, unit also gives you an exceptionally low center of gravity for safe, fast hauling.

Steady, low-cost earthmoving

Tournapull Rear-Dumps take on full payloads fast, maneuver easily, haul steadily on or off roads, and dump clean in seconds. They're easy to operate and extra safe on soft fills and over-bank dumps . . . on steep hills . . . on narrow, winding roads. Tournapull's simple construction cuts maintenance downtime, reduces cost per ton.

Get all the story . . . it's important to you! Call or write for complete details on Tournapull Rear-Dumps.

R-1461-DC-1

Three profit-building sizes

	Model B	Model C	Model D
Ton Capacity...	35 net tons	22 net tons	11 net tons
Bulk Capacity.. (heaped 1:1)	31 cu. yds.	22 cu. yds.	10.5 cu. yds.
with tailgate	33 cu. yds.	24 cu. yds.	11 cu. yds.
with sideboards ...	not offered	28 cu. yds.	not offered
with tail-gate and sideboards ...	not offered	29 cu. yds.	not offered

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Cement, Aggregate, Ready-mixed Concrete, Asphalt: Last, Feb. 6; Next, Mar. 6
- Iron and Steel Products, Pipe: Last, Feb. 13; Next, Mar. 13
- Wood Products, Glass, Explosives, Chemicals: Last, Feb. 20; Next, Mar. 20
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Jan. 30; Next, Mar. 27

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	GYPSUM PLASTER BOARD tapered edge per Msq ft ½"	⅝"	GYPSUM BOARD LATH plain or perf per Msq ft ½" x 16" x 48"	GYPSUM SHEATHING tongue & groove per Msq ft ½" x 2' x 8'	FIBER BOARD SHEATHING asph impreg & coat per Msq ft ½" sq ed	¾" T&G	FIBER BOARD INSULATION sq edge, paint per Msq ft ½"	MINERAL WOOL INSULATION loose, per 40-lb bag	3" batts per M sf	GLASS FIBER INSULATION loose, per 40-lb bag	3" batts per M sf	ALUMINUM FOIL 60¢ Kraft Expansible 1 side foil per roll of 250 s. f.	Blanket 2 layers foil per Msq. ft
Atlanta	$70.00	$80.00	$43.50	$70.00	$70.00	$127.00	$70.00	$1.00	$80.00	$2.00[b]	$75.00	....	....
Baltimore	51.25[f]	44.75[f]	32.55[f]	55.00[f]	65.00[f]	108.50[f]	69.00[f]	1.30	66.50	1.50	45.00	$4.00[g]	$33.50
Birmingham	73.00	60.00	47.77	75.00	65.00	136.50	81.00	1.40	70.00	1.60	75.00	3.30[g]	....
Boston	60.00[m]	50.00[m]	36.00[m]	60.00[m]	65.00[m]	120.00[m]	79.00[kn]	1.45	75.00	....	65.00	5.30	52.50
Chicago	67.00	52.00	43.00	62.00	85.00	123.00	85.00	1.85	80.00	....	63/65[l]	5.25[g]	....
Cincinnati	48.00[w]	42.85[w]	32.05[w]	51.16[w]	70.00[w]	125.00[w]	72.50[w]	1.30	63.00	1.30	76.50	3.12[j]	50.00
Cleveland	62.00	56.50	41.50	65.00	75.00	125.00	80.00	1.35/1.50	80.00	....	55.00[o]	20.00[e]	60.00
Dallas	55.00	52.50	42.50	60.00	68.50	117.50	68.50	1.94	66.70	1.40	66.10	4.30[g]	....
Denver	62.00	54.50	41.00	62.00	75.90	126.00	74.90	....	71.00[u]	1.30[s]	60.00[u]	11.00[r]	21.00
Detroit	57.50	49.50	36.00	61.00	69.50	90.00	69.00	....	....	1.95[b]	88.00	....	....
Kansas City	65.00	55.00	40.00	....	72.00	115.00	75.00	1.40	75.00	2.00	75.00	4.11[d]	.....ty
Los Angeles	64.00	59.00	0.33[5]s	63.50	75.00	125.00	80.00	....	83.00	1.35[s]	64.00	4.40[g]	.....
Minneapolis	75.00	65.00	0.40[s]	80.00	78.00	140.00	78.00	2.00	80.00	1.80	80.00	5.50	....
Montreal	56.00	47.40	36/39	63.00	63.25	.....	63.00	1.50	66.00	1.50	66.00	9.00[q]	56.00
New Orleans	57.00	48.00	45.00	60.00	75.00	125.00	72.50	1.75	65.00[o]	....	.....	....	....
New York	53.25	45.75	35.25	54.25	71.00	117.00	72.50	1.55[b]	68.50	1.55[b]	68.50	4.38[i]	52.50[c]
Philadelphia	50/55	48/53	34/40	49/54	68/73	105/110	55/65	....	60/70	....	70/75	5.60/6.34	40.50
Pittsburgh	59.00	47.00	35.00	.....	60.00	100.00	55.00	1.05[s]	55.00[s]	1.05[s]	55.00[s]	2.75[i]	38.50
St. Louis	65.00	55.00	39.00	70.00	75.00	120.00	80.00	1.35	85.00	1.85	70.00	4.50[i]	....
San Francisco	55.00	46.50	0.35[s]	58.00	68.00	109.00	67.00	1.80	66.50	1.80	66.50	4.95	55.00
Seattle	60.00	56.90	49.95	65.00	74.50	125.00	73.50	1.60[t]	74.00	1.90[*p]	80.00[*j]	4.25	46.80
Toronto	55.00	47.00	38.00	64.50	75.00	.....	.....	1.50	65.00	....	65.00	16.50[e]	44.95

Footnotes: [*] F.o.b. warehouse. [a] Semi thick. [b] 30¢ bag. [c] 12' to 24" width. [d] 40¢ kraft paper, 5 Msf, 100/500 rolls. [e] 20¢ sq ft kraft paper, 4" thick. [f] Full trailer loads. [g] 80¢ kraft paper backing. [h] LCL. [i] 40¢. [j] 80¢. [l] 2". [m] 10 ton quantities. [n] Distributor's siding. [o] Per Msf roll. [p] 32¢ bag. [q] 500 sf. [r] Per cwt. [s] 35¢ bag. [t] 26¢ bag. [u] Flame proof $75. [w] F.o.b. city. [x] Sq yd. [y] Temporarily off market

HOURLY WAGE RATES—Base rate + fringe benefits

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor: Building	Common Labor: Heavy Cons
Atlanta	$3.60	$2.95	$3.15+7½[d]	$3.225	$3.125	$3.30+7[e]	$3.30+25[e,d]	$1.60	$1.60
Baltimore	3.80+10½[e,d]	3.05+7½[e,d]	3.75+7½[e,d]	3.55/3.70+10[e,g]	3.45+7½[e,d]	3.425+7½[e,i]	3.30+7½[e,d]	1.90+7½[e,d]	1.90+7½[e,d]
Birmingham	3.65	2.85	3.25+10[e]	2.65[r]	3.05	3.425	3.32+10[e]	1.65	1.75
Boston	3.65+15[e,d]	3.25+10[e,d]	3.70+20[e,r]	3.65+10[e,f]	3.65+20[e]	3.55+12[e,s]	3.20+10[e,d]	2.45+7[e,d]	2.35+7[e,d]
Chicago	3.82½+7½[e]	3.45+20[e,r]	3.80+15[e,r]	3.40+5[e,r]	3.70+23[e,r]	3.65+22[e,r]	3.55+22[e,r]	2.77½+7½[e]	2.77½+7½[e]
Cincinnati	3.75	3.45	3.50+7½[e,d]	3.225/3.475	3.50	3.67+4[e,N]	3.65+9½[e]	2.50	2.40
Cleveland	3.715+10[e,r]	3.74	3.64+10[e,r]	3.74	3.765	3.64+10[e,d]	3.00	2.915	....
Dallas	3.775	3.10	3.175+7½[e]	3.20/3.25	3.56½+10[e,r]	3.25+7½[e]	3.25+8½[e]	1.62½	1.62½
Denver	3.75	3.20	3.125+7½[e,d]	2.95	3.375+12½[e,d,A]	3.40[r]	3.40+15[e,O]	2.10	2.10
Detroit	3.53+3½[e,H]	3.25+40[e,r]	3.60+22½[e,F]	3.20+20[e,k]	3.58+34[e,r]	3.65+34½[e,C]	3.63+14[e,B]	2.58+25[e,r]	2.58+25[e,r]
Kansas City	3.75	3.125	3.25	3.22	3.50	3.475[O]	3.40+9[e,W]	2.255	2.305
Los Angeles	3.90+10[e,b,b]	3.22½+20[e,d]	3.625+10½[e,R]	3.19+10[e,d]	3.94+15[e,d]	3.90[r]	3.70+28½[e]	2.50+7½[e]	2.50+7½[e]
Minneapolis	3.575	3.15	3.32	3.10	3.25+23[e,r]	3.25+36[e,n]	3.215+20[e,r]	2.40	2.55
New Orleans	3.425+5[e,r]	2.90	3.20+7½[e,r]	3.025+7½[e,r]	2.985+5[e,r]	3.275+7½[e,r]	3.25+15[e,r]	1.65	1.65
New York	4.25+37½[e,w]	4.00+32[e,h,j]	4.30+36[e,r]	4.25+34[e,r]	4.15+52[e,d]	4.65+45[e,F]	4.20+42[e,h,L]	2.90+23.2[e,V]	2.90+23.2[e,V]
Philadelphia	3.75+17[e,r]	3.535	4.05+18[e,M]	3.20½/3.95½+10[e,r]	3.90+15[e,r]	4.07½+16[e,n]	4.00+16[e,r]	2.25	2.55
Pittsburgh	3.95+17½[e,m]	3.525+7½[e,r]	3.90+10[e,d]	3.64+10[e,d]	3.575+17½[e,n]	4.00+28[e,d]	3.775+17½[e,n]	2.325+17½[e,n]	2.30+20[e,r,r]
St. Louis	3.75+28½[e]	3.45+10[e,r]	3.475+7½[e,r]	3.55[r]	3.80+7½[e]	3.83+29[e,r]	3.80+20[e,r]	2.50+10[e,r]	2.50+10[e,r]
San Francisco	3.95+52½[e,d,d]	3.175+30[e,r]	3.62½+10[e,r]	3.205+10[e,r]	3.69+30[e,r,R]	3.785+29[e,r]	3.70+46[e,K]	2.505+10[e,r]	2.505+10[e,r]
Seattle	3.75+10[e,d]	3.13+10[e,d]	3.40+10[e,d]	3.20+20[e,r]	3.40+10[e,d]	3.40+21½[e,X]	3.62+23[e,r]	2.70+10[e,d]	2.70+10[e,d]
Montreal	2.20+5[e,j]	2.00+4[e,j]	2.15+5[e,j]	1.90+4[e,j]	2.22+5[e,j]	2.20+5[e,j]	2.20+5[e,j]	1.40+3[e,j]	1.40+3[e,j]
Toronto	2.76+11[e,f]	2.50+10[e,f]	2.55+7½[e,f]	2.60+10[e,f]	2.60+20[e,f]	2.80+11[e,f]	2.69+17[e,f]	1.55+6[e,f]	1.55+6[e,f]

ENR Skilled Average (Bricklayers, Carpenters, Iron workers): $3.624. ENR Common Average $2.379.
*Revised.

	Truck drivers: 1½ T	under 4 cy	over 4 cy	Tractor Operators Incl. bulldozers: 34-49 hp	70-100 hp	100 & over	Tractor scraper 15-16 cy	Power cranes & shovels: ½ cy	¾ cy	Motor grader oper	Air comp oper	Air tool oper
Atlanta	$1.70	$1.80	$2.05	$2.70	$2.70	$2.70	$2.70	$3.225	$3.225	$2.70	$2.475	$1.77
Baltimore R	1.90+7½[e,r]	1.90+7½[e,r]	2.00+7½[e,kk]	3.15/3.30 +10[e,b]	3.15/3.30 +10[e,a,b]	3.15/3.30 +10[e,a,b]	3.15/3.30 +10[e,a,b]	3.55/3.70 +10[e,a,b]	3.55/3.70 +10[e,a,b]	3.15/3.30 +10[e,a,b]	2.85/3.00 +10[e,a,b]	2.00+7½[e,r]
Birmingham	1.73	1.92[f,l]	2.25[e,o]	2.79	2.79	2.79	2.93	2.93	2.93	2.89	2.52	1.90
Boston	2.395[c]	.....[c]	.....[c]	3.275+10[e,a,d]	3.275+10[e,a,d]	3.275+10[e,a,d]	3.275+10[e,a,d]	3.65+10[e,r]	3.65+10[e,r]	3.275+10[e,r]	3.20+10[e,r]	2.60+7[e,r,r]
Chicago	2.36+15[e,f,r,R]	.....	.....	3.15+5[e,r]	3.30+5[e,r]	3.20+5[e,r]	3.00+5[e,r]	3.75+5[e,r]	3.75+5[e,r]	3.25+5[e,r]	3.10+5[e,r]	.....
Cincinnati	2.33[e,r]	2.43[e,r]	2.53[e,r]	3.225	3.225	3.225	3.225	3.475	3.475	3.475	3.475	3.475
Cleveland	2.625+10[e,r]	2.625+10[e,r]	2.625+10[e,r]	3.49	3.49	3.49	3.49	3.74	3.74	3.49	3.355	3.355
Dallas	1.625	1.625	1.625/2.625[f]	1.625/2.625[f]	1.625/2.625[f]	1.625/2.625[f]	1.625/2.625[f]	1.625/2.625[f]	1.625/2.625[f]	1.625/2.625[f]	1.625/2.65[f]	1.775/2.00[f]
Denver	2.20	2.30	2.45	2.20	2.80	2.80	2.80	2.95	2.95	2.80	2.80	2.40
Detroit	2.61	2.61	2.61	3.50+10[e,r]	3.50+10[e,r]	3.50+10[e,r]	3.50+10[e,r]	3.50+10[e,r]	3.50+10[e,r]	3.50+10[e,r]	3.225+10[e,r]	2.71+25[e,r,m]
Kansas City	2.23[o]	2.23[o]	2.305[o]	2.425	2.975[o]	2.975[o]	2.975[o]	3.22	3.22	2.835	2.975[f]	2.35
Los Angeles	2.63+10[e,r]	2.63+10[e,r]	2.83+10[e,r]	3.47+10[e,r]	3.47+10[e,r]	3.47+10[e,r]	3.56+10[e,r]	3.56+10[e,r]	3.56+10[e,r]	3.56+10[e,r]	2.74+10[e,r]	2.71+7½[e,r]
Minneapolis	2.40	2.40[o]	2.55[r]	2.93	3.15[r]	.....	3.15	3.37[o]	3.63[o]	2.93	2.82	2.53
New Orleans	1.80	2.05	2.05	2.375+8[e,r]	3.025+7½[e,r]	3.025+7½[e,r]	3.025+7½[e,r]	3.025+7½[e,r]	3.025+7½[e,r]	3.025+7½[e,r]	2.375+7½[e,r]	1.75
New York	2.21+22½[e,r,r]	2.75+14[e,kk]	2.75+14[e,kk]	3.625+29[e,k]	3.625+29[e,k]	3.625+29[e,k]	3.75+30[e,k]	4.50+36[e,k]	4.50+36[e,k]	3.75+30[e,k]	3.75+30[e,k,l]	3.35+27[e,r,r]
Philadelphia	—2.215/2.35+12½[e,r,r]—			—3.20½/3.95½+10[e,r]—			3.20½/3.95½ +10[e,r]	—3.20½/3.95½+10[e,r]—		3.20½/3.95½ +10[e,r]	3.20+10[e,r]	2.25+10[e,r]
Pittsburgh	2.37+20[e,m]	2.51+20[e,m]	2.61+20[e,m]	3.44+10[e,r]	3.44+10[e,r]	3.44+10[e,r]	3.44+10[e,r]	3.64+10[e,r]	3.64+10[e,r]	3.64+10[e,r]	3.15+10[e,r]	2.30+20[e,m]
St. Louis	2.575+7½[e,r,r]	2.65+7½[e,r]	2.65+7½[e,r]	3.55[k,k]	3.55[k,k]	3.55[k,k]	3.55[k,k]	3.55[k,k]	3.55[k,k]	3.55[k,k]	3.00[k,k]	3.00[k,k]
San Francisco	2.55+10[e,r]	2.55+10[e,r]	2.69+10[e,r]	3.32+10[e,r]	3.32+10[e,r]	3.32+10[e,r]	3.32+10[e,r]	3.65+10[e,r]	3.65+10[e,r]	3.48+10[e,r]	2.93+10[e,r]	2.755+10[e,r]
Seattle	2.87+17½[e,r,r]	2.87+17½[e,d,d,s]	3.07+17½[e,r,r,r]	3.26+20[e,r,r]	3.26+20[e,r,r]	3.26+20[e,r,r]	3.26+20[e,r,r]	3.63+20[e,r,r]	3.63+20[e,r,r]	3.35+20[e,r,r]	2.99+20[e,r,r]	2.90+10[e,r]
Montreal	1.40+3[e,l,l]	1.40+5[e,l,l]	1.40+3[e,l,l]	1.60+4[e,l,l]	1.83+4[e,l,l]	1.83+4[e,l,l]	1.83+4[e,l,l]	2.09+5[e,l,l]	2.09+5[e,l,l]	1.83+4[e,l,l]	1.70+4[e,l,l]	1.70+4[e,l,l]
Toronto	1.60+6[e,r,r]	1.60+6[e,r,r]	1.60+6[e,r,r]	2.00+8[e,r,r]	2.10+8[e,r,r]	2.10+8[e,r,r]	2.10+8[e,r,r]	2.60+10[e,r,r]	2.60+10[e,r,r]	2.10+8[e,r,r]	2.15+9[e,r,r]	2.15+9[e,r,r]

[a] H & WF. [b] lower rates, straight time; other broken. [c] 2-axle; 10 wh. 3 axle $2.45; Euclid $2.65. [d] intermediate. [e] bldg contr.; highway $2.45+7¢ WF. [f] less than 2-T. [g] up 6 cy. [h] 4% WF, 4% PF. [i] 6-8 cy. [j] plus $2 pd by employer for hosp. death benefits to family. [k] bldg constr; steel contr $3.475. [l] higher rates are union, other taken from min. wage approved by County Comm. Court. [m] 10¢ H & W, 5¢ PF. [n] flatbed. [o] under 10 cy. [p] over 10 cy. [q] over 80 hp. [r] blade grader. [s] WF. [t] single. [u] incl. 10¢ H & W. [w] 7½¢ H & W. 5¢ PF. [x] 7½¢ WF, 10¢ PF. [y] to 3½ cy. [z] 3½ cy & over. [aa] plus W & PF. [bb] 3% WF, 2% PF; plus 11 PH. [cc] 11¢ WF, 11½¢ PF, 11 PH. [dd] up to 5 cy. [ee] 5 cy & over. [ff] 1½ to 3 T. [gg] up to 5 T; 5 T & over, 2.25. [hh] 5¢ H & WF, 2½¢ PF. [ii] 4% VF [kk] Incl. 10¢ WF. [ll] Incl. 2% VF. [mm] 10¢ H & WF, 10¢ ins, 5¢ VP. [oo] Plus $2.25 wk. WF. [ss] 5% WF, plus 8 PH. [tt] 10¢ H & WF, 10¢ PF. [R] Revised.

[*] Cost of living bonus incl. in base pay. [a] 6 hr day. [b] 7 hr. day. [c] 5% vac. stamp fund plus 10¢ WF for bricklayers; 4% VF for electricians plus 8¢ WF, 1% PF. [d] H & WF. [e] 10¢ H & W, 10¢ VF. [f] 10¢ H & W, 10¢ PF, 10¢ VF. [h] $2.85 homes & housing plus 7½¢ WF. [i] WF. [j] Inc. 4% VF; 1% PF pd by employer. [k] 10¢ WF, 5¢ VP, 5¢ HP. [l] 4% VF. [m] 7½¢ WF, 10¢ PF. [n] 7% V & Hol. 3% H & W, 1% PF. [o] 10¢ WF, 10¢ PF. [p] 3% WF, 3% PF +10¢ in lieu of pd. hol. [q] 10¢ WF, 6% V & H, 3% PF. [r] 4% WF, 20¢ PF. [s] 5% W & PF, 4% VF, 1% NC, 1% JI, plus 6 PH. [t] Inc. 10¢ WF. [u] 10¢ WF, 1% PF, ¼% apprent. [v] 1 drum; 2 drums, 2.80. [w] 15¢ WF, 15¢ VF. [x] 2% VF. [y] 10¢ H & W, 10¢ PF. [z] 10¢ WF, 5¢ HP. [A] 15¢ WF, 15¢ PF, 20¢ BF. [B] 7½¢ VP, 5¢ PF 1½¢ Ed. F. [C] 9¢ H & W & Ins., 7% V & H. [D] 10¢ H & WF, 5¢ indus. prom. [E] 6% WF, plus travel pay per day. [F] Plus $4 per day annuity contrib. [G] 10¢ WF, 10¢ VF, 3¢ prom. [H] 10¢ WF, 10¢ VP, 3% PF, 2% PH. [I] 15¢ H & WF, 5¢ advtg. [J] 5% WF, 6 PH, 3% PF. [K] 25¢ W & PF, 15¢ VF, plus 6¢ misc. [L] 3% WF, 3% PF, 3% VF, 1% Ed. F. [M] 10½¢ WF, 7½¢ PF. [N] 1% PF. [O] 10¢ WF, 1% NECA. [P] 10¢ H ins., 7½¢ PF, 5¢ VF. [Q] 2 drums; 1 drum $2.85/3.00 + 10¢ WF [R] 10¢ H & WF, 2¢ admin. 1¢ apprent. [S] 10¢ H & WF, 15¢ PF. [T] H & W, VF. [U] 10¢ WF, 13¢ VF, 3¢ PF. [V] 4% WF, 4% PF. [W] 7½¢ WF, 1½¢ Ed. F. [X] 7½¢ WF, 14¢ VF. [aa] 7¢ WF, 15¢ PF. [bb] 8¢ WF, 2¢ advg. [dd] 17½¢ WF, 20¢ PF, 10¢ PH, 5¢ Jt Bd. [ff] 10¢ H & W, 5¢ PF. [gg] 10¢ ins. [hh] 7½¢ H & WF, 5¢ indus. prom [ii] 4% WF, 4% PF, 6 PH. [jj] 2%VF

MEXICO CITY PRICES

Pesos, F.o.b. City		Jan. '58	Feb. '58
Common Wages—Building (8 hr. day) (Peons)	av. per hr.	1.57*R*	1.57
Common Wages—Heavy Const. (8 hr. day) (Peons)	av. per hr.	1.98*R*	2.00
Skilled Labor Wages			
Carpenters (8 hr. day) 1 cl.	av. per hr.	3.25*R*	3.25
Bricklayers (8 hr. day) 1 cl.	av. per hr.	2.87*R*	2.87
Struct. Iron Workers (8 hr. day) Remachadores	av. per hr.	4.28*R*	4.28

Struct. Steel, Shapes		Jan. '58	Feb. '58
3"-15" x 12 meters	per metric ton	2300.00[f]	2300.00[f]
[f] fob Monterrey			
Reinf. Steel, Corrugated Rods			
⅜" x 11 meters	per ton	2100.00*R*	2100.00
½" x 11 meters	per ton	2100.00	2100.00
⅝" x 11 meters	per ton	2000.00	2000.00
¾" x 11 meters	per ton	2000.00	2000.00
⅞" x 11 meters	per ton	2000.00	2000.00
1" x 11 meters	per ton	2000.00	2000.00

Gravel truck load at 3½ cu. meters		Jan. '58	Feb. '58
Blue Gravel	per tr. load	75.00	75.00
Rose Gravel	per tr. load	65.00	65.00
Cement, Std. Port. (Tolteca)	per ton	240.00	240.00
Lumber			
1" Pine	per M ft.	1700.00	1700.00
1½" Pine	per M ft.	1900.00	1900.00

*R revised

Working in 2nd gear, Adams 660 grader levels stabilizing fill through Big Cypress Swamp, on contruction of Florida highway 29E. Prior to this job, Collins' crew completed a ten-mile section of highway 41, through the heart of the Everglades. Said operator Johnny Wahtley, "I've been operating the '660' on a lot of rough jobs for the past 7 months. The power moldboard really works swell... especially in cutching and in close quarters. I can slide the blade in and out, it saves a lot of work."

Through Florida Everglades

3 Adams* graders speed construction of highway across cypress swamp

E. E. Collins Contracting Co., Miami, Florida, contracted to build a 12-mi. section of state highway 29E — southwest of Immokalee, in the Everglades. When completed, the project will provide a new highway — across Big Cypress Swamp — between Naples and Immokalee. It will shorten the present route by about 30 mi.

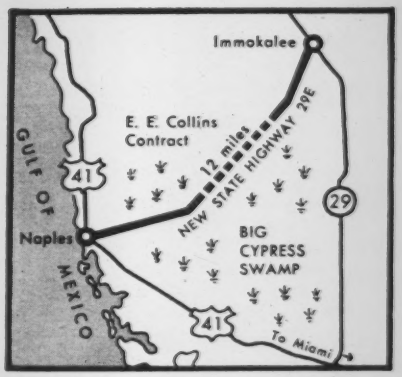
Important tools in Collins' equipment fleet are 4 heavy-duty Adams graders: two "660's", a "610", and a "550". The three larger LeTourneau-Westinghouse models were assigned to handle all grading on this project.

Level 83,000 yds. of stabilizing fill

A mixture of blue-marl base-rock and sand — hauled in from nearby pit — was used as stabilizer over the swampy sections. On the entire project, the 3 Adams graders leveled 83,000 yds. of stabilizing material. In addition to handling all subgrading, the two 150 hp "660's" and a 100 hp "610" graded 8′ shoulders and 32′ slopes on each side of the 20′ wide roadway.

"Adams graders have tremendous power"

Asst. General Superintendent A. C. Hallock says, "These Adams graders have tremendous power... and maintenance on them has been very low." Veteran operator C. A. Fox (a grader operator since 1923) added, "I've operated most makes of graders... the '660' is the best. I've never been bogged down with this machine — although I have pulled out a lot of other equipment with it while working in the Everglades."



Map shows 12-mile road contract of E. E. Collins Construction Co. The new state highway will shorten the present route from Naples to Immokalee (via 41 and 29), by about 30 miles.

See for yourself

Why not let us arrange for a demonstration? See how Adams — with its greater range of working speeds and its ease of blade operation — outproduces any other grader of comparable size, power, or price. 6 sizes — 60 to 190 hp. Choice of GM or Cummins engines on 5 larger models. 190 hp model has torque-converter drive.

Besides the two 660's and 610 Adams graders used on the Naples to Immokalee project, Collins Contracting Co. also owns a heavy-duty Adams 550 grader. Here the "550" grades rough shoulders on dead-end city street in Miami. Says Job Foreman G. M. Still, "Our Adams turns out more work than any other similar piece of equipment in its class." From the cab, 30-year grader man James M. Stalling added, "I like the speed... especially in reverse. It has good visibility and is very maneuverable... carries a nice load." *Trademark G-1509-DC-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Cement, Aggregate Ready-mixed Concrete, Asphalt: Last, Feb. 6; Next, Mar. 6
- Iron and Steel Products, pipe: Last, Feb. 13; Next, Mar. 13
- Wage Rates, Building Board, Lath, Insulation: Last, Jan. 30; Next, Apr. 3
- Wood Products, Glass Explosives, Chemicals: Last, Feb. 20; Next, Mar. 20

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE — LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton, in paper, Carload lot, Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta	$149.90p	$149.90p	$299.80p	$334.55p	.....	.....	$30.50p	$32.70p	$23.50	$24.50	$.....
Baltimore	203.00	217.00	406.00	485.50	596.00	681.00	36.00k	41.00k	33.00	22.00	.....
Birmingham	135.00p	152.00p	.....	303.00p	376.00p	465.00p	27.00ff	38.00y	35.02	22.30	26.33g
Boston	232.00†	248.00†R	463.25†	556.00†	.....	.....	41.50p	46.50p	39.20†	31.20†	.....
Chicago	135.00	145.00	280.00	.....	.....	.....	30.00	32.00	38.00	35.20o	.....
Cincinnati	205.00j	225.00j	296.00jdd	213.00y	288.00j	314.00j	48.75j	47.00j	30.04j	26.04j	30.04j
Cleveland	209.00	223.00	.....	475.00	.....	.....	41.00	51.50	31.00	25.00	.....
Dallas	152.00	152.00	300.00	364.50	446.25	552.50	26.75	45.25	41.80	24.58	28.50
Denver	.....	.....	.....	.....	.....	.....	31.50	49.50	46.00p	42.00p	46.00p
Detroit	273.00	298.00	545.00	.....	662.00	755.00	47.50p	48.00p	38.00	30.00	...
Kansas City	158.00	158.00	312.00	312.00	400.00	500.00	33.00	33.00	36.26	34.26	29.76
Los Angeles	r	r	r	r	r	r	32.50§	...	38.00	38.00	39.00
Minneapolis	188.00p	210.00p	429.00p	210.00pw	.....	.....	48.00vp	52.50y	47.00bbe	37.00bbe	49.00bbde
Montreal	170.00eu	178.00eu	325.00eus	270.00q	400.00q	.....	48.25b	56.30b	39.00	22.00	13.25
New Orleans	186.00	186.00	380.00	380.00	.....	.....	40.00	55.00	44.00	33.00	33.00P
New York	175.30h	187.00h	280.40eh	283.00hn	.....	.....	44.00	.....	38.00	35.00	..
Philadelphia	169.00	180.20	337.90	405.00	.....	.....	30/34	38/42	27.60	25.60	3.17m
Pittsburgh	147.50t	157.75t	295.00t	335.00t	435.00t	500.00t	39.00t	46.00t	32.00t	28.00t	.....
St. Louis	178.50p	185.00p	391.00p	401.00p	459.00	621.50	43.00l	41.50	0.95aa	.80aa	1.35ii
San Francisco	156.85*	177.10*	235.30dd*	.....	.....	.....	43.00*	43.00*	27.75	27.75	30.80i
Seattle	235.00p	270.00p	490.00p	265.00pw	.....	.....	48.00	62.00	52.00bb	38.00bb	4.50mbb
Toronto	146.00	157.00	289.00	234.00f	395.00	.....	35.00	63.00	36.00	33.50	31.50

*§ F.o.b. Yard. *• F.o.b. plant Stockton. *† F.o.b. yard Roxbury. *a Smooth. *b $4.50 del. *c 8 x 12 x 12 in.-3 cell. *d Pulverized hot. *e 5%, 10th following month. *f 8 x 8 x 12. *g Lumps, $26.72. *h F.o.b. trucks, job site N.Y.C *i 60 lb sacks. *j Truck load or over. *k $1.00 discount. *l Red face. *m Per bbl., 180 lb. processed. *n 7¾ x 7¾ x 12. *o Mason's double hydrated pressure. *p Truck lots. *q Provincial and Municipal tax extra. *r Not used: earthquake danger. *s 8 x 16 x 12. *t 2% cash. *u Incl. Federal tax. *v Sand lime. *w 5 x 8 x 12. *y Chi common. *z Pebble; 80 lb sack. *aa 50 lb sack. *bb LCL. *dd 8 x 12 x 12. *ff 80% common. *gg Rough. $40.00 smooth. *R revised.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry a	WHITE LEAD Per 100 lb. in 100 lb. cases In oil w	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES; Carload lots f.o.b. factory Rolls, slate surfaced, 55–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl. per ton
Atlanta	$16.50	$30.125	$3.59	$3.86	$3.31	$3.39	$2.20	$2.62	$0.67	$57.75
Baltimore	16.25	29.75	3.00	4.40	3.50	2.78	4.25	4.25	.48	50.18
Birmingham	16.50	30.125	3.90	3.40	....	3.09	2.29ii	2.29ii	.82ff	45.00aa
Boston	16.25	29.75	....	....	....	3.63g q	2.83ag	2.83ag	.50g	58.00g
Chicago	16.25	29.75	....	....	....	3.69tu	2.98to	2.98to	46.00bbs	57.70t
Cincinnati	16.25	29.75	....	....	....	3.13	2.70	2.73	.428y	55.96
Cleveland	16.25	29.75	2.85pq	2.90pq	2.92pq	3.73q	2.85o	2.85o	.501y	49.00pq
Dallas	16.50	30.50	..	3.20B	....	2.95u	2.95o	2.95o	.464	65.00kk
Denver	16.75	30.25	3.98	5.20	3.70	2.63	2.80o	2.40o	.43ff	50.00
Detroit	16.25	29.75	2.70	3.95	2.70	3.30	2.84f	2.409f	.58ff	47.30
Kansas City	16.25	30.50	3.99	3.43	3.01	2.72ii	1.82o	1.84y	.524y	.....
Los Angeles	16.25	30.00	3.30n	4.50n	4.20n	3.20n	2.15en	l	.70ny	l
Minneapolis	16.25	29.88/29.75	....	....	....	2.99	2.41hi	2.41hi	.442i	50.00r
Montreal	.....	.....	5.02Dff	5.94zff	6.85kff	5.40	4.65f	4.65f	1.60	....
New Orleans	.....	.....	....	....	....	3.09	2.29	2.85	0.680	....
New York	15.25C	29.75	....	....	....	3.19	2.45o	2.45o	.425a	49.00*
Philadelphia	16.25	29.75	3.60	3.40/3.65	3.50/4.60	3.00/3.30	2.54o	2.54o	.37/.45	48/54
Pittsburgh	16.25	29.75	2.20vE	2.25vF	2.25vG	3.37z	2.59z	.....	.45	.....
St. Louis	16.25	29.75	.....	.....	.....	3.70his	2.75hh	2.75hh	.46hy	64.00
San Francisco	16.25	30.00	3.20	4.30	3.50	2.69	2.09aa	3.10	.47jj	54.00
Seattle	16.25	30.25	3.47	4.19oe	....	3.82pcc	3.30kcc	.....	.50oc	51.40oc
Toronto	.....	.....	5.00	5.75	5.50	4.45	4.10e	3.30e	1.70j	62.00A

*† Delivered. * Note: Red lead in oil 50% higher than white lead in oil. *• Aver. wt. approx. 425 to 550 lb drums. *a Red lead prices change frequently due to pig lead price changes. *b U.S. War Dept. Spec. 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e 15 lbs. *f Per 432 sq ft. *g F.o.b. yard, Roxbury. *h Per roll, 65 lb. *i Net carload prices, Minneapolis and vicinity. *j 45 gal containers. *k Over 80% ferric oxide. *l Not used. *n F.o.b. city. *o Per 60 lb roll. *p 5-drum, 50 gal each. *q Per 90-lb roll. *r F.o.b. factory, Chicago. *s Truckload. *t Incl. Federal tax. *u Per 90-lb square. *v Per ton. *w Price to contractors $1.25 less. *x Ready-mixed. *y 55-gal container. *z Drums. *aa 15 lb. sq ft. roll. *bb Roofers coating and cement. *cc LCL, truck delivery. *ee Asphalt pitch in 100 lb package. *ff 5-gal drums. *gg F.o.b. factory. *hh Incl. freight. *ii Per roll. *jj Asbestos roof coating. *kk 400 lb barrels. *R ASTM Spec. D962–49. *C 98%. *D Std. black. *J Milt. spec.: E TTP27; F TTV81; G TTP31. *H Not quoted after Oct. 1957

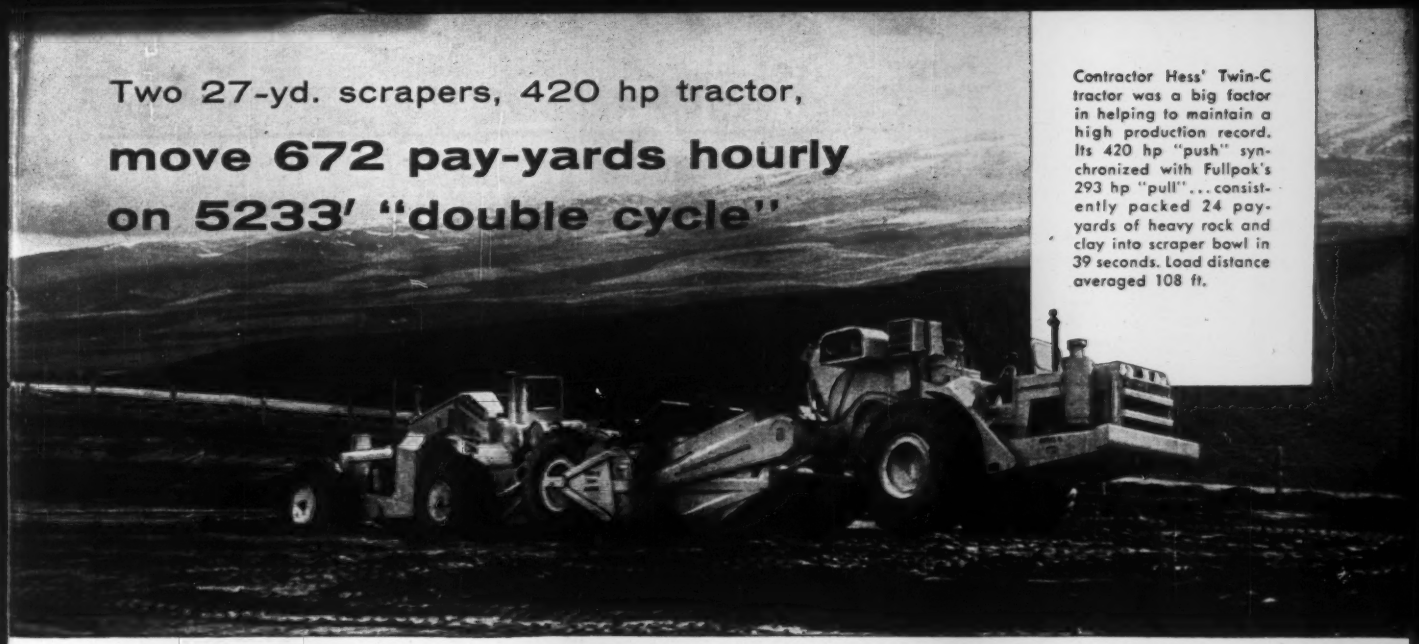
PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER‡ Neat per ton	Gauging per ton	VERMICULITE‡ Home Insulation pellets	Plaster aggregate	Concrete Aggregate Untreated	PERLITE‡ Plaster Aggregate	Concrete Aggregate Untreated	ALUMINUM SHEET†† Flat .102" th 36"x96" & 48"x144" per lb‡	Corr roof .032" th 35"x12' per sht	STAINLESS STEEL† SHEET-TYPE 302g 20 ga 48"x96–120" per cwtth	28 ga 36"x120" per cwtmm	COPPER WATER* TUBING-TYPE L 2000 ft lots per ft ½"b	⅝"e
			per bag of 4 cu ft										
Atlanta	$31.00	$36.00	$1.55s	$1.65s	$1.80al	$1.65	$1.65	$0.422n	$8.97n	$61.44n	$67.50	$18.74f	$23.41f
Baltimore	23.25	33.65	0.95	1.15	1.15	1.15	1.65	0.431	0.489r	56.25	64.25	0.1674	0.2341
Birmingham	33.00	39.00	1.55	1.55	1.80l	1.55	1.55l	0.466	10.48	67.34	76.09	0.1608	0.2244
Boston	22.00	30.00	1.40	1.40	1.45	1.45	1.50	0.466	30.10p	65.42dd	71.92ddff	0.1562	0.2176
Chicago	26.80	26.80	1.55	1.60	1.60l	1.60	1.60	0.506z	10.376a	65.15aee	73.90aee	0.1562	0.2176
Cincinnati	28.00*	28.00*	1.75	1.75	1.75	1.85	1.90	0.434	9.56	65.28	74.03ff	0.1608	0.2244
Cleveland	26.50	43.00	1.13k	1.16ii	1.24l	1.45	1.45	0.506aa	8.66	65.33oo	74.08oo	15.62f	21.67f
Dallas	30.00	32.00	1.05	1.21	1.32	1.21	1.32	0.474	0.510r	66.59	80.00	0.16	0.2240
Denver	25.00	25.00	1.50	1.40	1.50	1.40	1.55	0.462	10.37	66.30gg	75.05gg	0.1825	25.46
Detroit	25.00	25.00	1.28	1.32	1.41	1.45	1.45	0.456a	10.376a	65.15a	73.90a	12.78f	21.76f
Kansas City	30.00	35.00	1.14	1.18	1.26l	1.18	....	0.444	11.40	67.50	76.25	15.62f	21.76f
Los Angeles	26.00	27.00	1.25k	1.20k	1.25	1.00	1.10	0.506	10.543d	67.10	75.85	0.1562	0.2176
Minneapolis	33.00	33.00	1.55	1.60	1.80	1.40	1.40	0.503	15.15w	65.71	72.21ff	0.15.62f	0.21.76f
Montreal	27.60h	35.60h	1.20	1.40	1.50	1.15v	1.15v	0.437	9.92	66.50	.....	0.1827	0.2160
New Orleans	32.00	45.00	1.25	1.25	1.25	1.25	1.25	0.444	8.786	68.00	76.00	0.1608	0.2244
New York	24.20	30.20	1.35	1.30	1.50	1.40	1.40	0.506a	10.14ad	68.58	77.33	16.08f	22.44f
Philadelphia	23/25	32.00	1.35	1.35	1.40l	1.05	1.05	0.44aw	9.46a	66/68a	75/77a	20.00f	28.75f
Pittsburgh	28.00nn	28.00nn	1.60nn	1.50nn	1.35	1.65	1.65	0.456	9.83	64.00	72.75pp	0.1419	0.1980
St. Louis	29.00	40.00	1.35	1.60jj	1.50	1.60	1.60	0.456	10.37	68.11	74.61y	16.08fm	22.44fm
San Francisco	27.85	32.00	1.20	1.20	1.30	1.20o	1.30o	0.505	9.13	65.20	73.75	0.1562	.2176
Seattle	41.00	44.00	1.55	1.25k	1.85l	1.50k	....	0.506	9.964	67.08	88.08	0.1562	0.2176
Toronto	28.00	45.50	1.20	1.30	1.45l	....	1.55	0.4095	24.00ae	73.74	86.52	0.2562	0.3029g

‡trucklots, delivered †fob warehouse *fob city *a delivered *b ½" O.D. *c ⅝" O.D. *d 0.100"th *e 34" x 80" sheet *f per 100 ft *g 5 tons & up; cold roll, anneal & pickled; 2B finish *h incl. Federal tax *i add 25¢ for pint of additive *j 1100 & 3003 alloy, mill finish *k bag of 3 cu ft *l treated with air entraining agent *m 2-10M ft *n fob mill, r allow *o 250 sacks or more *p 100 sq ft *r per lb. *s 30 lb bag *t 36" x 96;–10.81 lb/sh; 48" x 144"; 21.7 lb/sh *u 19.31 lb/sh *v fob plant *w 48" x 144" *x 100th *y 27 gauge *aa 16M lb & up *dd add $1.00 cwt boxing. *ee 4 tons & up *ff 26 ga *gg add $2/cwt boxing; $0.75/cwt on skids *hh Theoretical wt for 48" x 96"; 60.4-lb. per sh. *ii 300-bag lots *jj 100-lb bag *mm Theoretical wt; 19.7-lb per sh. *nn 2% cash *oo skid packed *pp type 304

Two 27-yd. scrapers, 420 hp tractor,

move 672 pay-yards hourly on 5233′ "double cycle"



Contractor Hess' Twin-C tractor was a big factor in helping to maintain a high production record. Its 420 hp "push" synchronized with Fullpak's 293 hp "pull"... consistently packed 24 pay-yards of heavy rock and clay into scraper bowl in 39 seconds. Load distance averaged 108 ft.

Marion J. Hess Construction Company, Malad, Idaho, put dirtmoving on a high-speed basis relocating 6 miles of Idaho State Highway 34 — between Thatcher and Niter. To move 75% of the 400,000 yds. of heavy rock and clay — on hauls up to 1½ miles — contractor brought in his LeTourneau-Westinghouse team of two B Tournapulls® with 27-yd. Fullpak* scrapers, and a big 420 hp Twin-C* tractor. Here's how these high-speed rubber-tired units performed on a typical section of the job.

Build fill at both ends of cut

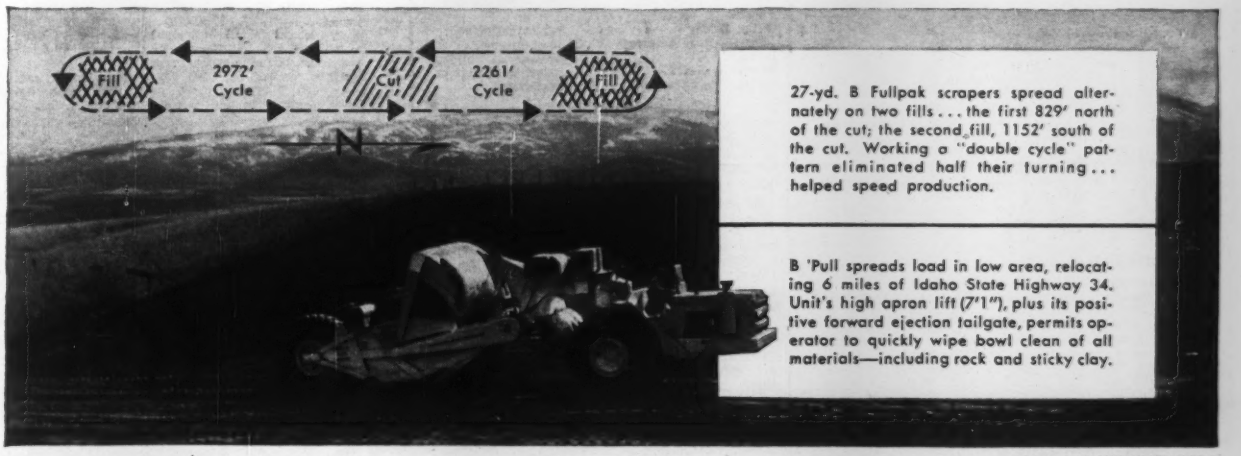
Working a "double cycle" dirtmoving pattern (see sketch), contractor was able to haul fill — from a 16-17′ deep cut—to low areas on either end of load area. According to Foreman Erwin L. Allen, Tournapull scrapers picked-up 24 pay-yds. of clay and rock in only 39 seconds when push-loaded over 108′ by powerful Twin-C tractor. Units then hauled material 829′ north of the cut, where load was spread in 35 seconds. Fullpaks made tight 180° turn, and traveled back to load-area for a second cut in opposite direction. Tournapulls hauled 1152′ south of the cut to second fill, where load was spread. Unit then returned to begin new "double cycle". Each B 'Pull* completed the 5233′ "double cycle" in an average of 7 minutes 24 seconds... hauled 14 loads hourly. That's 336 pay-yards per hour per unit... or a combined output of 672 yards hourly for the 2 Fullpaks.

"Get around fast"

Pleased with such performance, Foreman Erwin L. Allen said, "The B Fullpaks are doing a good job. They load and get around fast. And, the Twin-C tractor is the best pusher... has the power and maneuverability to keep these big earthmovers really rolling."

Speed your production dirtmoving

Why not see how you, too, can speed *your* production dirtmoving? Let us show you the LeTourneau-Westinghouse 27-yd. B Fullpak scraper and the 420 hp Twin-C tractor in action.



27-yd. B Fullpak scrapers spread alternately on two fills... the first 829′ north of the cut; the second fill, 1152′ south of the cut. Working a "double cycle" pattern eliminated half their turning... helped speed production.

B 'Pull spreads load in low area, relocating 6 miles of Idaho State Highway 34. Unit's high apron lift (7′1″), plus its positive forward ejection tailgate, permits operator to quickly wipe bowl clean of all materials—including rock and sticky clay.

*Trademark BPTW-1571-DCJ-1

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

▲ **Conn., Trumbull**—SCHOOL—BA 3/7—Town of Trumbull, School Bldg. Comn., Middlebrooks Ave., high school, Middlebrooks Ave. $2,000,000. Plans deposit $100. Lyons & Mather, 211 State St., Bridgeport, archts. CD 5/6/57.

BUILDINGS—LB & CA

▲ **H. V. Collins Co.,** 99 Gano St., Providence, R. I., CA **$2,313,300** Memorial HIGH SCHOOL, and CONVENT, etc. Slocum Rd. and Rte. 6, NORTH DARTMOUTH, MASS. Roman Catholic Archdiocese of Fall River, 362 Highland Ave., Fall River, Mass. Bids Feb. 5. CD 2/12, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—LB & CA

▲ **MARYLAND**—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2, Bids opened 2/11,
Md.—**Burkeholder & Burkeholder,** 1025 Connecticut Ave., N. W., Washington, D. C., LB **$1,289,269,** grading, drainage, surf. 4.036 mi. U. S. Rte. 219 and 1.753 mi. Rte. 135 from Mountain Lake Park to Oakland, G-270-2-620, Garrett Co.;
Md.—**S. T. Brotemarkle Constr. Co.,** Perrin Bldg., Cumberland, Md., LB **$1,021,578,** grading, drainage, surf. 2.352 mi. U. S. 40, incl. 48 x 104 ft. prestressed concrete bridge over Flintstone Creek, Gilpin. A-464-8-620, Allegany Co.;
Md.—**Dean & Beavers,** Hollywood, Md., LB **$413,461,** grading, drainage, surf. 4.589 mi. State Rte. 5, near Valley Lee., SM 316-3-520, St. Mary's Co. CD 1/16.

BUILDINGS—LB & CA

Shadow Lake Estates, Box 19, Red Bank, N. J., Owner Builds. **$750,000,** 30 HOUSES on South Lake Dr. and Nut Swamp Rd., MIDDLETOWN, N. J. Henry Le Brecque, 17 Linden Place, Red Bank, N. J., engr.-archt.

▲ **The Siegler Corp.,** 408 Summit Ave., Jersey City, N. J., CA, general contract YMHA-YWHA CENTER, Chancellor Ave. and Aldine St., NEWARK, N. J. Jewish Community Foundation of Essex Co., 30 Clinton Ave., Newark, N. J., Total est. **$1,000,000,** CD 11/18;
Elizabeth Iron Works, Green Lane, Box 360, Elizabeth, N. J., CA, structural steel, (Newark, N. J.).

SOUTH

HEAVY CONSTRUCTION—BA

Ala., Decatur—BA 3/11—Municipal Utilities Bd., City Hall, rebuild superstructures two intakes constr. 4MGD addn. to water treatment plant, Contract A $900,000, Plans deposit $75; install pipe furn. by city, install valves, etc.; pave, excavate etc. in connection with water treatment plant addns., Contract B, $450,000. Plans deposit $60. Polglaze & Basenberg, 812-S. 27th St., Birmingham, engrs.

▲† **La., Shreveport**—RUNWAY IMPRVS.—BA 3/19—U. S. Eng., 300 Broadway, Little Rock, Ark., runway, airfield paving, blast protection pvmnt., utilizing 58,950 cu. yd. sub-base and base bit. binder, surf. courses, bit. surf. runway, etc., modification of drainage sys. and existing runway and approach lighting sys., Barksdale Air Force Base, ENG-03-050-58-25. $1,000,000-$3,000,000. CD 12/27.

BUILDINGS—BA

▲† **Ky., Fort Knox**—ORDNANCE SHOP, etc.—BA 3/20—U. S. Eng., P. O. Box 59, Louisville, ordnance shop area, medium tank shop, general purpose vehicle shop, warehouse and central heating plant, ENG-15-029-58-25. $3,500,000. CD 9/17.

BUILDINGS—LB & CA

▲ **Rea Constr. Co.,** Pinevl Rd., Charlotte, N. C., CA Est. exceeds **$1,000,000,** constr. 1 story Knitted Cloth PLANT, South Strafford Rd., WINSTON-SALEM, N. C. P. H. Hanes Knitting Co., 350 5th Ave., New York, N. Y. Robert & Co. Assocs., 96 Poplar N.W., Atlanta, Ga., archts.-engrs. CD 4/22/52.

J. Hilbert Sapp, Inc., 1905 N. Orange Ave., Orlando, Fla., CA **$847,500,** STATE OFFICE BLDG., WINTER PARK, FLA. Bd. Comrs. State Institutions, Terry C. Lee, secy., Tallahassee, Fla. Bids Jan. 15. CD 1/31, under LB.

▲ **W. F. Holt & Sons,** 1119 Laurel St., Nashville, Tenn. CA **$3,257,000** OPERATIONS BUILDING in Railroad Gulch, NASHVILLE, TENN. Baptist Sunday School Bd., 127 9th Ave. N., Nashville, Tenn. Bids Jan. 28, awarded 2/7. CD 2/5, under LB;
Nashville Machine & Supply Co., Woodycrest Ave., Nashville, Tenn. CA **$498,345,** plumbing, heating and air conditioning facilities (Nashville, Tenn.).

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **O., Cincinnati**—BA 3/4—Bd. Comrs. **Hamilton Co.,** Section "A" of Ross Run Trunk Sewer, $1,318,905; Section "B" $693,282. Plans deposit $16.50. CD 11/9/56.

BUILDINGS—LB & CA

▲ **Stakich Realty Co.,** 815 E. 185th St., Cleveland 19, O., Own Forces. **$1,300,000,** 110 HOMES, off Brandywine Rd., NORTHFIELD, O. Louis J. Rotman, 31715 Vine St., Willowick, O., archt.

▲ **Peterson Constr. Co.,** Wapakoneta, O., LB **$800,000** (11 bidders) new Van Wert Co. HOSPITAL, VAN WERT, O. Comrs. Van Wert Co., Court House, Van Wert, O. Bids Jan. 28. CD 12/17;
H. A. Tilton & Son, 220 W. High St., Lima, O., LB **$369,995,** plumbing, heating, ventilating and air-conditioning contr., Van Wert hospital (Van Wert, O.)

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

† **Tex., Amarillo**—AIR FIELD LIGHTING—BA 3/12—U. S. Eng., Box 61, Tulsa, Okla., airfield lighting (runways, taxiways, overrun, etc.) sub-station, beacon tower, diesel engine generator unit, Amarillo Air Force Base, ENG-34-066-58-22. $500,000-$1,000,000. CD 9/17.

BUILDINGS—BA

▲ **Mo., St. Joseph**—HOSPITAL—BA 5/1—Daughters of Charity, Sister Marguerite, hospital admin., 9th and Powell Sts., 6 story, bsmnt., sub-bsmnt. hospital. Over $4,000,000. Everett Johns, 5121½ Francis St., archt. CD 10/28, under St. Joseph's Hospital as owner.

BUILDINGS—SLC

▲ **Tex., Evadale**—MILL EXPANSION—East Texas Paper & Pulp Co., Evadale, soon lets contract paper mill expan. $7,000,000-$8,000,000. Howard & Simon, 16 E. Hastings St., Vancouver, B. C., or c/o owner, archts. Brown & Root, Inc., Eng. Dpt., 4600 Clinton, Houston, engr. CD 1/13.

Tex., Houston—HOTEL-MOTEL—Morin Scott, 103½ E. 7th St., Austin, soon lets contract 154 rooms and apartment units hotel-motel. $750,000-$1,750,000. Winfred O. Gustafson, 1312 A.S. Congress St., Austin, archt. Walter P. Moore, 2 Pinedale St., engr. CD 1/7.

HEAVY CONSTRUCTION—LB & CA

▲ **Guy H. James Constr. Co.,** 4908 North Sewell St., Oklahoma City, Okla. LB **$1,109,717.** impounding reservoir on Boggy Creek north of Atoka, OKLAHOMA. City, City Hall, Oklahoma City, Okla. Bids Feb. 11.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

ARIZONA—State Hy. Dpt., 17th. Ave and Jackson St., Phoenix, Bids opened 2/7,
TGK Constr. Co., 2750 W. McDowell Rd., Phoenix, Ariz. CA **$863,358,** est. $929,321, select material cement treated aggreg. base, bit. plant mix, seal coat 3.9 mi. 4 lane divided hy. Yuma Casa Grand Hy., Maricopa Co. CD 1/27.

▲† **Diversified Builders Inc.,** 1616 South Greenwood Ave., Montebello, Calif. LB **$3,587,000,** constr. transworld hangar at Los Angeles International Airport, LOS ANGELES, CALIF. Trans World Airlines Inc., 5700 Avion Dr., Los Angeles 45, Calif. (Correction—contractor). CD 2/13, under CA.

BUILDINGS—LB & CA

▲ **John W. McMichael,** 9312 California Ave., South Gate, Calif. Owner Builds. **$1,505,000.** 1,560 sq. ft. DWELLINGS, GARDEN GROVE, CALIF. Roy L. Kiter & Assoc., 3321 Tweedy Blvd., South Gate, Calif., archt.

▲ **Vinnell Co., Inc.,** 1145 Westminster Ave., Alhambra, Calif. LB **$3,970,000** (6 bidders) RESIDENCE HALLS UNITS 1, 2 and 3 at Riverside Campus, RIVERSIDE, CALIF. Bd. Regents, University of California, Riverside, Calif. Bids Feb. 12. CD 1/28.

CANADA

HEAVY CONSTRUCTION—LB & CA

NEW BRUNSWICK—Provincial Dpt. P. Wks., Parliament Bldgs., Fredericton,
Atlas Constr. Co. Ltd., Box 7, Fredericton, N. B., CA **$900,000** (14 bidders) constr. complete sub-structure and 5 approach spans for Hartland Trans-Canada Hy. Bridge over Saint John River at Hartland. Bids Jan. 21, awarded Feb. 10. Foundation of Canada Eng. Corp. Ltd., 1980 Sherbrooke St. W., Montreal, Que., engrs. CD 1/16.

▲ **Atlas Constr. (Toronto) Ltd.,** 46 Eglinton Ave. E., Toronto, and **Schwenger Constr. Ltd.,** 1255 Beach Rd., Hamilton, Ont., LB **$750,000** each, (36 bidders) Contr. A. constr. storm relief sewer, 6 ft. diám. line from Thames River east along Mill and Pall Mall Sts., to Maitland St., LONDON, ONT. City, City Hall, London, Ont. James F. MacLaren Assocs., 321 Bloor St. E., Toronto, Ont., engrs. CD 8/1/56.
Atlas Constr. (London) Ltd., 46 Eglinton Ave. E., Toronto, Ont., LB **$730,000.** Contr. B storm relief sewer, second portion of sewer extending along Central to William down William to Princess, east to Adelade and south to Lorne Ave. (London, Ont.);
Matthews Constr. Co. Ltd., 406 Princess Ave., London, Ont., LB **$279,958,** Contr. C, storm relief sewer South Ontario St. to Queen's east to Quebec and south to Dundas St. (London, Ont.). CD 8/1/56.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $75,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Calif., Oakland**—East Bay Municipal Utility Dist., 2130 Adeline St., **$252,000,000** bond election June 3 water supply, incl. 2 dams on Mokelumne River, aqueduct, distr. sys. and terminal reservoirs.

▲ **Tex., Dallas**—City, City Hall, 45,000 lin ft. 90 in. c. i. water Main near East City limits, **$3,000,000.** G. L. Moon, Inc., 12402 Jupiter Rd., consult. engr. CD 9/4/56.

SEWERS, WASTE DISPOSAL

▲ **Ky., Shively**—City, sewage disposal plant, sewer lines, **$2,000,000.** Watkins & Martin, 251 E. High St., Lexington, or 4726 Preston Hy., Louisville, consult. engrs. CD 2/26.

▲ **Ore., Portland**—Tri-County Sanitary Auth., Courthouse, 20-year program of trunk and interceptor sewers and treatment plants, Multnomah, Washington and Clackamas Counties, **$27,000,000.** Stevens & Thompson, 2234 S. Worth Ave., consult. engrs. Paul Northrup, Court House, owners staff engr.

(Continued on page 74)

New SUPERIOR Heavy-Duty SCREED SUPPORTS

Pat. Applied For

For Use with 1¼" and 1½" I.D. Pipe Screeds and Vibratory Screeding Equipment

ADJUSTABLE SCREED HOLDER

Consists of a 1" threaded rod to which is welded a cradle to hold the pipe screed. This cradle is slotted as shown so that the arms may be bent over to secure the 1¼" or 1½" I.D. pipe screed. Threaded onto the rods is a half nut which provides the adjustment.

Especially Designed for Use on Bridges, Underpasses and Overpasses

These Screed Supports are designed to take the heavy loads imposed by traveling vibrating screeding equipment. The Bases for the screed holders are of two types: (1) The Metal Base for use on structural steel members; (2) the Chair-Type Base for use on a plywood deck.

On Structural Steel: As shown above, the Metal Base is tack-welded to the top flange on approximately four foot centers. The Screed Holder is set into the base, and adjusted to height by turning the nut. The threads are fast, three to the inch, and of a contour type, non-clogging and easily cleaned.

On Wood or Plywood Decks: The Chair Base is set on the deck at approximately four foot centers. It is easily secured to the deck by nailing across the upturned legs. If desired, legs can be supplied of galvanized wire. The Chair Base with holder is shown below.

PERFORMANCE

Superior's Heavy-Duty Adjustable Screed Supports have been used on turnpike structures and other projects. Results in the field indicate that this method of supporting screeds provides a simple answer to an otherwise expensive and complicated set up. *Write for Bulletin.*

Adjustable Standard SUPERIOR SCREED CHAIRS

FOR FORMED SLABS 4½" AND GREATER

With re-usable screed holders using 1" I.D. pipe and rectangular bars for screeds.

FOR SLABS ON FILL

With re-usable screed holders using 1" I.D. pipe and rectangular bars for screeds.

HOLDER INSERTED IN CHAIR BASE

Only the inexpensive bases are left in the concrete. The Adjustable Holders are easily removed, together with the pipe screed, because the holders are set, not screwed into the base. The nut fully covers the base opening and prevents concrete from entering.

SUPERIOR CONCRETE ACCESSORIES, INC.

9301 King St. Franklin Park, Ill. (A Suburb of Chicago)

New York Office
1775 Broadway, New York 19, N. Y.

Pacific Coast Plant
2100 Williams St., San Leandro, Calif.

PRESSTITE No. 99*

THE TOUGHEST, MOST ECONOMICAL SEALER AVAILABLE for AIRFIELD PAVING JOINTS

- Resists being BLASTED OUT by terrific jet engine thrust.
- Resists MELTING and BLOWOUT from super-elevated temperatures from jet after-burners.
- Resists SHOCK and IMPACT from heavy aircraft.
- Unaffected by jet fuel spillage.

WRITE for illustrated copy of Bulletin 99

- *A Two-Component, Cold-Applied Sealer*
- *For Sealing Sawed and Formed Joints*
- * *Meets Federal Specification SS-S-170, 23 May 1955*

PRESSTITE Sealing Compounds

PRESSTITE-KEYSTONE ENGINEERING PRODUCTS COMPANY

K A P

A Division of AMERICAN-MARIETTA COMPANY
3784 CHOUTEAU AVENUE, ST. LOUIS 10, MISSOURI

(Continued from page 72)

BRIDGES

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,

Atlantic Co.—bridge approach on Rte. 40 at Atlantic City-Pleasantville Blvd., $100,000.

Burlington Co. — channelization of Burlington-Bristol Bridge approach on Rte. 130, $100,000.

Camden Co.—constr. Cuthbert Road overpass, Rte. 70 in Delaware Twp., $1,250,000.

Cape May Co.—Route 9 bridge across the Cape May Canal and approaches, $3,000,000, CD 10/9.

Sussex Co.—bridge on Rte. 206 at Ross' Corner, $400,000.

Union Co.—pedestrian overpass on Rte. 22 in Hillside, $85,000.

▲ **WISCONSIN and MINNESOTA**—State Hy. Comn., State Office Bldg., Madison, Wis. and State Hy. Dpt., 1246 University Ave., St. Paul, Minn., constr. 4-lane, 8,500 ft. interstate hy. bridge 54 ft. wide, across St. Louis Bay between Duluth, Minn. and Superior, Wis. $20,000,000. Howard, Needles, Tamman & Bergendorf, 1805 Grand St., Kansas City, Mo., consult. engrs.

STREETS AND ROADS

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford,

Middlesex Co.—relocation of Route 9 between Old Saybrook and Middletown as a limited access highway, Chester, Deep River, Haddam, Essex, Middletown, Old Saybrook. $30,000,000.

▲ **Mich., Detroit**—City, Glenn C. Richards, comr., City-County Bldg., resurf. streets: 48 mi. East Side and 47 mi. West Side, incl. 38 mi. major streets and 57 mi. residential streets: Congress, West Jefferson, Lafayette, Monroe, Bush, Third, West Vernor, West Warren, East Warren, Evergreen, East McNichols, East 7-Mile Rd., Joseph Campau, John R. $3,950,000. M. F. Wagnitz, 528 City-County Bldg., city engr. CD 3/30/43.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,

Bergen Co.—constr. Bergen Expressway (eastern portion of new Rte. 46 Interstate Freeway) from Fort Lee to Passaic River, FAI, $6,000,000. CD 4/18/55.

wid'n. Rte. 3 from Passaic River to Hackensack River, incl. a bridge, FAI, $3,000,000.

Camden and Burlington Counties—dualization of Rte. 73 from Rte. 130 to Rte. 38, FAI, $1,000,000.

Camden and Gloucester Counties—constr. new Rte. 130 Interstate Freeway from Merga to new Rte. 42 Interstate Freeway south of Camden, FAI, $6,500,000.

paving Rte. 42 Freeway from Coles Rd. to Turnersville, FAI, $2,750,000.

Camden Co.—imprv. Clements Bridge Rd. intersection of Rte. 30, FAI, $700,000.

Essex and Union Counties—constr. new Rte. 22 Interstate Freeway from Newark to Berkeley Heights, FAI $7,050,000. CD 4/18/55.

Essex Co.—constr. Essex Co. East-West Freeway from Prospect Street to Newark, FAI, $5,000,000. CD 4/18/55.

Hunterdon Co.—constr. new Rte. 22 Interstate Freeway from Central railroad of N. J. Pattenburg Rd. FAI, $7,000,000.

Mercer Co.—constr. first portion of new interstate freeway (Trenton By-Pass) from Rte. 29 to Scotch Rd., FAI, $2,000,000.

resurf. Rte. 1 from Penns Neck to Trenton, FAI, $1,500,000.

Monmouth and Ocean Counties—dualization of Rte. 35 from Red Bank south, FAI, $2,000,000. CD 4/18/55.

Morris and Essex Counties—wid'n. Rte. 10 from Whippany to Okner Rd., FAI, $800,000.

Morris Co.—constr. new Rte. 46 Interstate Freeway from Mt. Arlington to existing Rte. 46, FAI, $8,500,000. CD 10/9.

Passaic and Bergan Counties—dualization of Rte. 208 from Goffle Rd. to Grandview Ave., FAI, $500,000. CD 4/18/55.

dualization of Rte. 20 from its Broadway connection to Rte. 4, FAI, $500,000. CD 4/18/55.

Somerset Co.—constr. new Middlesex Interstate Freeway from Rte. 28 to River Rd., FAI, $8,000,000.

Union Co.—wid'n. Rte. 28 at Roselle Park, FAI, $1,000,000.

▲ **SOUTH DAKOTA**—State Dpt. Hys., H. C. Remfer, state hy. engr., Pierre,

Minnehaha Co.—grading, concrete paving 19.5 mi. 4 lane interstate hy. from near US 77 at Sioux Falls to S. D. 44 at Worthing, Proj. I 093-3 (1) & I 093-2 (1) $11,000,000.

Pennington Co.—concrete paving and bridges 10 mi. 4 lane Interstate Hy. near US 14 from Black Hawk east with spur to Rapid City, I 092-3-(2) $6,000,000.

EARTHWORK, WATERWAYS

▲ **Ontario**—Ontario Hydro-Electric Power Comn., 620 University Ave., Toronto, 131,000 kw electric power station on Abitibi River, at Otter Rapids, 60 mi. north east of Kapuskasing with main power for uranium mining camp in Blind River region of Ontario, $35,000,000.

▲ **Ontario**—Ontario Hydro-Electric Power Comn., 620 University Ave., Toronto, 31,000 kw electric power station on Mississagi River at Red Rock, 12 mi. northeast of Thessalon, with power for use of mining developments, $15,000,000.

AIRPORTS

▲ **Ky., Erlanger**—RUNWAYS, etc.—Kenton County Airport Bd., Court St., Covington, plans by Howard Ellister, 706 Walnut St., Cincinnati, O., repairs to existing runways and holding pads, Boone County

Airport. $3,000,000. Hall-McAllister & Stockwell, 706 Walnut, Cincinnati, O., engrs. CD 2/29/56.

▲ **Mass., East Boston**—AIRPORT IMPRVS.—Commonwealth of Mass., Airport Management Bd., c/o Div. Bldg., Constr., 38 Chauncy St., Boston, L-58-1, airport imprvs., incl. hold points, intersection, runways, taxiways, seal coating runways, etc. modernize snow strips, field drainage, pavement taxiways, islands, etc. fire station and maint. bldg., etc. and incidentals at Logan Airport. $5,000,000. Dewey & Kropper Assoc., 150 Causeway St., Boston, engrs. CD 2/21/56.

▲ **O., Dayton**—TERMINAL BLDG.—City, City Hall, Cox Municipal Airport, plans by Yount, Sullivan & Lecklider, 3rd National Bldg., terminal bldg. at Cox Airport, incl. parking apron, acess road, drainage and utilities, $4,478,000. CD 11/29.

FOREIGN

▲ **B. W. I., Trinidad, Port of Spain**—HOTEL, etc.—Hotels Development Corp., Trinidad and Hilton Hotels International, Waldorf Astoria, New York 22, N. Y., U. S. A., plans by Warner, Burns, Toan & Lunde, 414 Madison Ave., New York, N. Y., U. S. A., and Toro Ferrer, Puerto Rico, 4 story [redacted] bldg. hotel with 2 swimming pools. $5,500,000.

PUBLIC BUILDINGS

▲ **Calif., Garden Grove**—SCHOOLS—Garden Grove Union High School Dist. of Orange Co., County Court House Santa Ana, voted $2,000,000 bonds, schools. James H. Van Dyke, 2234 Beverly Blvd., Los Angeles, owners staff archt.

▲ **Calif., Santa Clara**—SCHOOLS—Santa Clara Union High School Dist., 551 Jackson St., voted $4,500,000, bonds Feb. 4, constr. 2nd phase of Buchser High School and new Adrian Wilcox High School. L. F. Richards, 1033 Jackson St., archt. CD 11/25.

▲† **D. C., Wash.**—DPT. COMMERCE—General Services Admin., General Services Bldg., Zone 25, plans by William A. Brown, 1223 Connecticut Ave. N.W., Department of Commerce Office Building, air-conditioned. $4,430,000. CD 10/26/45.

▲ **Ill., DeKalb**—DORMITORIES, etc.—Northern Illinois State Teachers College, two 4 story mens' and womens' dormitories and 2 story dining hall. $3,840,000. CD 1/9/56.

▲ **Mass., Chicopee**—HOUSING—City, John A. Soltys, chn. Housing Authority, Chicomansett St., Mass. 8-1, Federal Low-Rent Housing, Curtis Terrace Tract. $2,165,000, CD 3/27/53; 42 unit housing for the Elderly, Meetinghouse Rd., $700,000. Joseph L. Paley, Inc., 105 Newbury St., Boston, consult. engr.

▲† **Mo., St. Louis**—OFFICE—General Services Admin., P. Bldg. Service, Franklin G. Floete, Admin., 19 and F Sts. N. W., Wash. 25, D. C., 482,000 sq. ft. federal offices bldg., in block bounded by Market, 15th, Walnut and 16th Sts. $13,760,000. CD 10/1/56.

▲ **N. J., Newark**—HOUSING—Newark Housing Auth., 57 Sussex St., 2000 unit housing, 40 block area bounded by Bergen St., Springfield, Belmont and Avon Aves, Central Ward. $24,000,000. CD 9/12/50.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 299 Broadway, Zone 7, Low Income Housing, one 21 story bldg. Amsterdam Ave., St. Nicholas Ave., W. 154 St. and W. 155 St. $3,750,000.

▲ **N. Y., Silver Creek**—SCHOOL—Silver Creek Bd. Educ., Silver Creek, bond election Feb. 26, high school. $2,328,000. Foit & Baschnagel, 250 Delaware Ave., Buffalo, Zone 2, archts.

▲ **N. Y., West New Brighton**—HOUSING—New York City Housing Auth., 299 Broadway, New York, Zone 7, Proj. NY-5-40, West Brighton Houses for 486 families on site bounded by Castleton Ave., Alaska St., Henderson Ave. and Campbell St. $6,000,000.

▲ **O., Canton**—COURTHOUSE—Comrs. Stark Co., Courthouse, Canton, bond election Nov. 4, county courthouse. $7,000,000. CD 11/12/47

▲ **O., Columbus**—SCHOOL, etc.—Southwestern School Dist., 1390 Harrisburg Pike, voted bonds Jan. 28, high school, and other imprvs. $2,500,000. Van Buren, Ayers & Blackburn, 406 Oak Ave., archts. CD 2/11.

▲ **O., Parma**—SCHOOLS, etc.—Bd. Educ., 5401 W 54th St., Cleveland, Zone 29, bond election May 6, 4 elementary schools and central warehouse. $2,850,000, Fulton Dela Motte & Assocs., 6014 Euclid Ave., Cleveland, Zone 3, archts. CD 11/9/56.

▲ **O., Shelby**—PLANT—City, City Hall, light plant addn. $3,701,700. Wm. C. Kammerer & Assoc., 1900 Euclid Ave., Cleveland, Zone 15, consult. engrs.

▲ **Pa., Phila.**—SCIENCE—Temple University, Broad and Berk Sts., plans by Nolan & Swinburne, 226 S. 16th St., 4 story, 145,000 sq. ft. science bldg. $4,000,000. To be paid for by State.

▲ **Alta., Calgary**—COURT HOUSE, etc.—Alberta Dpt. P. Wks., Parliament Bldgs., Edmonton, Court House and Land Titles Bldg: 4 story Court House with provision for addnl. 4 story if required; 2 or 2½ story L shaped will be added to new bldg. to provide for small debts Court, etc. $5,000,000.

COMMERCIAL BUILDINGS

▲ **Ark., Little Rock**—FEDERAL OFFICE—General Services Admin., 19th and F Sts., Wash., D. C., plans by Swaim & Allen & Assoc., Ginocchio, Cromwell & Assoc., 331 Gazette Bldg., Little Rock, 5 story, air-conditioned federal office bldg (lease-purchase) to be occupied by 14 federal agencies, $9,150,000. CD 9/12, under Public Bldgs.

(Continued on page 78)

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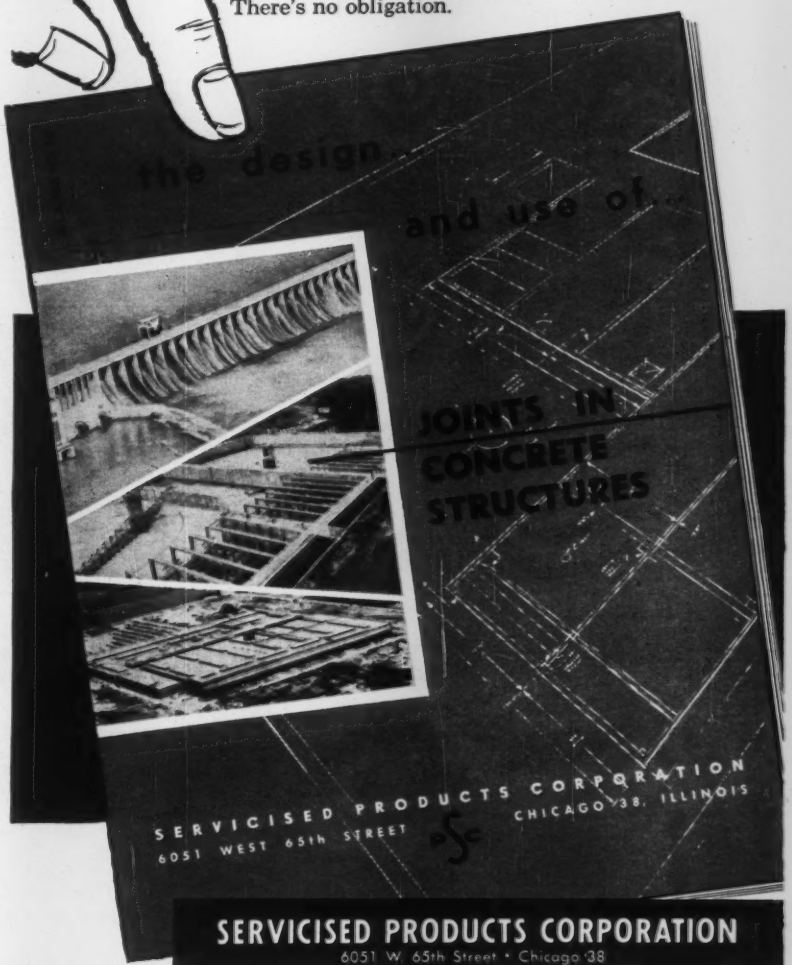

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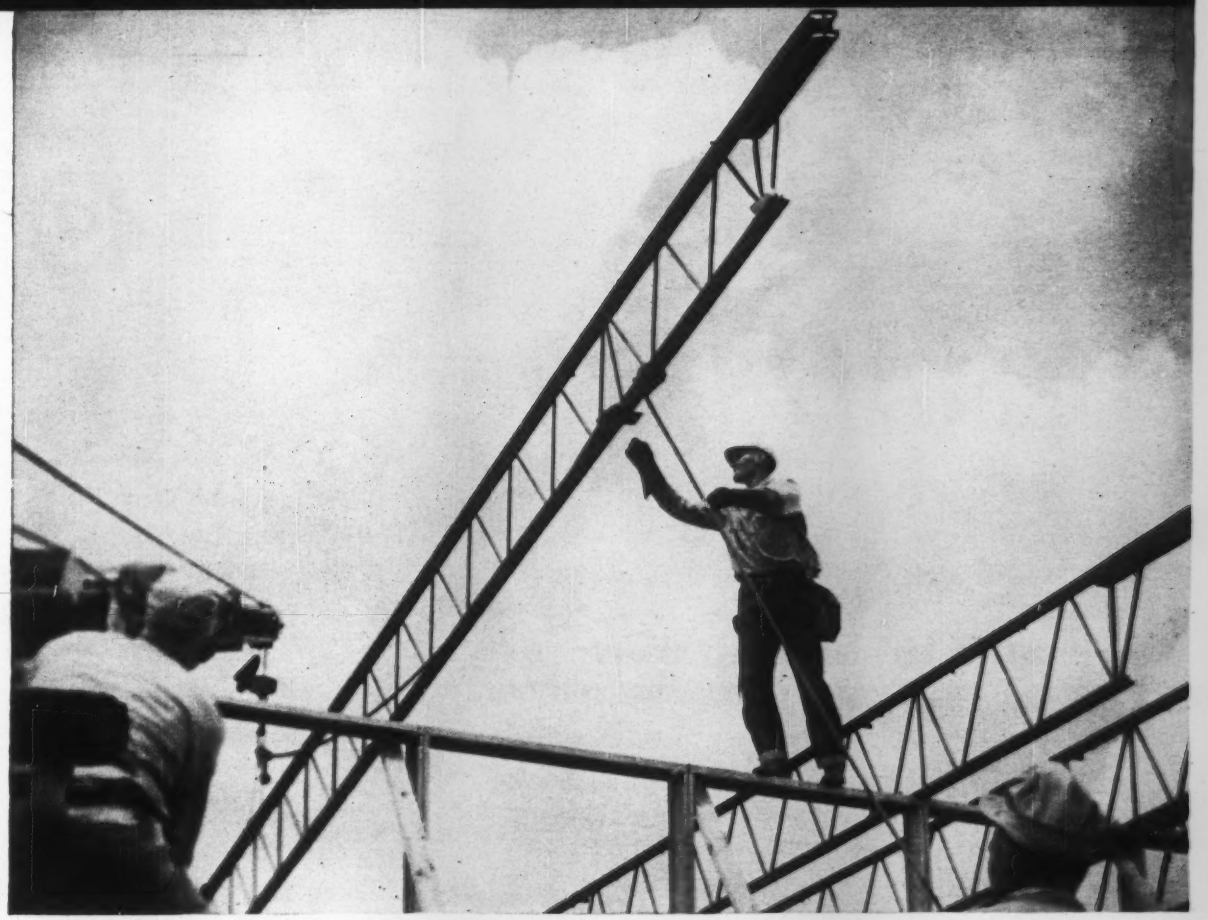

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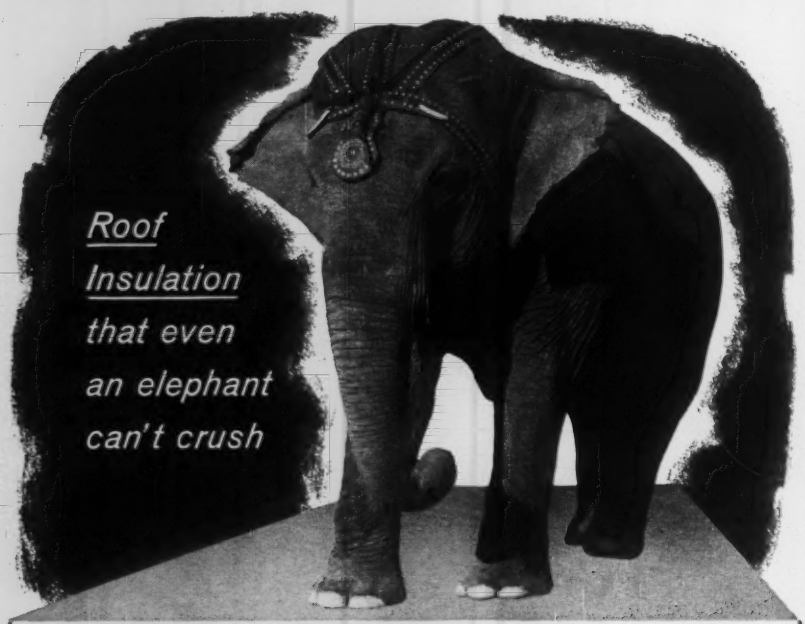

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(Continued from page 75)

▲ **Ark., Little Rock**—OFFICE—Milner Enterprises, Inc., c/o Hedrick & Stanley, archts., T. & P. Bldg., Fort Worth, Tex., 12 story office bldg. with ground floor of retail stores and 500-car parking deck, **$2,577,000.**

▲ **Calif., El Segundo**—HOTEL—Allen E. Siegal Enterprisees, 9952 Santa Monica Blvd., Beverely Hills, plans by Raymond Stockdale, 3260 Hillock St., Los Angeles, 5 story, 100,000 sq. ft. masonry Thunderbird Hotel, Sepulveda Blvd. **$2,000,000.**

▲ **Calif., Redwood City**—OFFICE, etc.—Angletri Enterprise, Inc., 3436 Oak Knoll Dr., plans by Wurster, Bernardi & Emmons, 202 Green St., San Francisco, 9 story office bldg. and 3 story garage with restaurant, Winslow, Fuller and Allerton Sts. **$3,500,000.**

▲ **Calif., San Francisco**—FEDERAL OFFICE—General Services Admin., c/o Regional Director, 49 4th St., plans by Blanchard & Maher, Albert F. Roller, Stone, Mulloy, Marraccini & Patterson and John Carl Warnecke, 111 New Montgomery St., 15 story, 1,466,000 sq. ft. federal office bldg. (lease-purchase). **$45,300,000.** CD 11/29/56.

▲ **Conn., Bloomfield**—HOUSING—Green Acres, Inc., 139 Wintonbury Ave., plans by Irving W. Rutherford, 49 Garden St., Hartford, 200 houses, Cadwell Rd. **$2,000,000.** Sanderson & Washburn, 866 Park Ave., consult. engrs.

▲ **D. C., Wash.**—SCIENCE—Georgetown University, 37th and O Sts. N. W., plans by Murphy & Locraft, 1518 P St. N. W., science bldg. **$2,500,000.** CD 10/26/53.

▲ **Ill., West Dundee**—MOTEL—Sleepy Hollow Corp., Sleepy Hollow Manor, plans by Goldstein & Assocs., 809 N. Rush St., Chicago, Ill., motel 250 units, swimming pool; restaurant, cocktail lounges (2) and shops. **$2,000,000.**

▲ **Mass., Brookline**—DORMITORIES, etc.—Wheelock College, Henry H. Perry, pres. Bd. Trustees, 132 Riverway, Boston, plans by Carl Koch & Assoc., 55 Brattle St., Cambridge, dormitories and classroom bldg. **$4,000,000.** Bids in May.

▲ **N. Y., Batavia**—APARTMENTS—J. P. Straubinger Constr. Co., 229 French, Buffalo, 100 garden type apartments on 23 acre site in southwest part of city. **$11,000,000.**

▲ **O., Cleveland**—MOTEL—Milmar, Inc., 1805 E. 40th St., Zone 3, plans by Victor Gruen & Assocs., Los Angeles, Calif., motel, SW corner of Euclid and Green Rds. **$2,500,000.** Hotel Corp of America, lessee.

▲ **Okla., Oklahoma City**—POST OFFICE, etc.—General Services Admin., 18 and F Sts. N.W., Wash. 25, D. C., plans by Dow Gumerson & Benham Eng. Co. & Affiliates, 1029 N. Walker St., constr. U. S. Court House and Federal Office Bldg. (lease-purchase). **$7,140,000.** CD 2/10/50, under Public Bldgs.

▲ **Va., Arlington**—HOTEL—Syndicate c/o John Jamieson White & Assoc., archts., 1145 19th St., N. W., Wash., D. C., 8 story hotel, South 24th St. and Glebe Rd. **$2,600,000.**

▲ **Va., Portsmouth**—POST OFFICE—General Services Admin., 18th and F Sts. N.W., Wash. 25, D. C., plans by Oliver & Smith, T. David Fitz-Gibbon, 333 West Freemason St., Norfolk, constr. U.S. Post Office, Dpts. Defense, Treasury and Health, Education and Welfare will occupy bldg. (lease-purchase). **$3,575,000.**

INDUSTRIAL BUILDINGS

▲ **Ark., Helena**—PLANT—Arkansas Power & Light Co., 4th and Louisiana Sts., Little Rock, 350,000 kw. electric power plant. **$56,000,000.** To be completed 1961. CD 7/19/48, under Arkansas.

▲ **Calif., Salinas**—PLANT—Nestle Co., c/o Engineer, 2 Williams St., White Plains, N. Y., 4 story chocolate plant on 30 acre site south of S. Abbott St., near Blanco Rd. **$5,000,000.**

▲ **Ill., Chicago**—HOG and SHEEP HOUSE—Union Stock Yards & Transit Co., Union Stock Yards, plans by A. Epstein & Sons, Inc., 2011 W. Pershing Rd., hog and sheep house, rail shipping facilities, railroad tracks, concrete ramps. **$3,000,000.**

▲ **Ill., Joliet**—PLANT—Olin-Mathieson Chemical Corp., 460 Park Ave., New York, N. Y., designs by F. H. McGraw & Co., 51 E. 42nd St., New York, N. Y., corrugated box plant. **$6,000,000.**

▲ **Miss., Jonesboro**—PLANT—Henderson Sugar Refinery, Inc., 749 South Peters St., New Orleans, La., sugar refinery, Bayou Casotte Harbor area, near here. **$8,000,000.** Truman B. Wayne & Assocs., P.O. Box 13086, Houston 19, Tex., engrs. (**Correction**—location of project). CD 2/6, under La., Jonesboro.

▲ **O., Cincinnati**—PLANT—Ralston Purina Co., 835 S. 8th St., St. Louis, Mo., cereal mfg. plant. **$2,000,000.**

▲ **Pa., Lafayette Hill**—MANUFACTURING, etc.—McNeil Laboratories, Inc., 2900 N. 17th St., Phila., mfg. office and laboratory. **$2,000,000.**

▲ **Pa., Phila.**—INDUSTRIAL—Cabot-Cabot & Forbes, Inc., 60 State St., Boston, Mass., 600,000 sq. ft. 113 acre tract industrial development. **$5,000,000.**

UNCLASSIFIED

▲ **Tex., Houston**—STADIUM, etc.—Harris County, c/o Commrs. Court, Courthouse, stadium, **$1,000,000-$3,500,000;** providing hard paved parking at stadium, **$500,000;** drainage for 300-acre stadium tract, **$100,000;** lighting, incl. lighting for stadium playing field, inside lines for stadium lighting and area lighting, **$100,000.**

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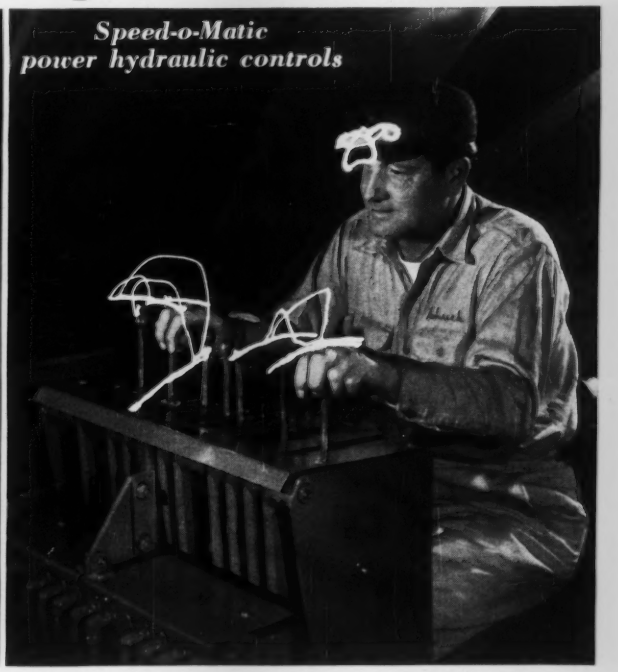

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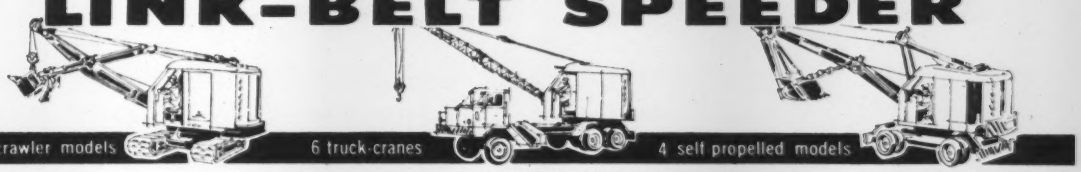

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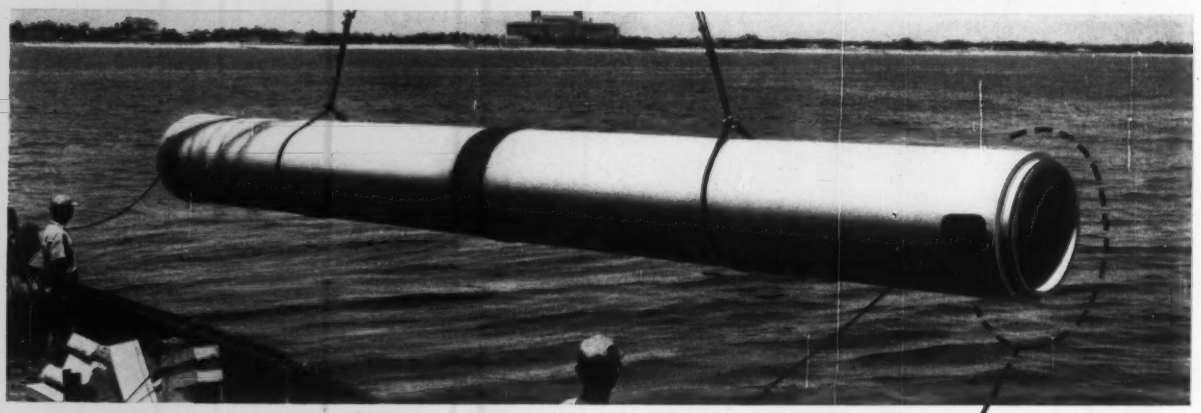

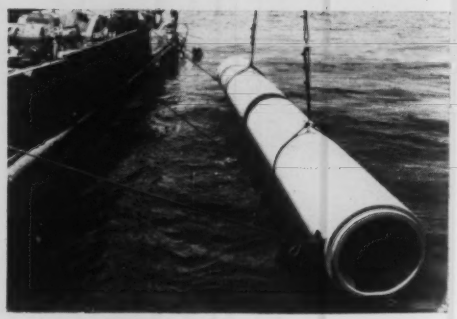

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲† **Me., Limestone** — UTILITIES — BA On Or About 3/25—U. S. Eng., 150 Causeway St., Boston, Mass., constr. surface water supply, Loring Air Force Base, ENG-19-016-58-101. $1,500,000-$2,000,000. CD 9/17.

▲† **Connecticut**—BA 4/1—Office of U. S. Eng., 150 Causeway St., Boston 14, Mass., constr. Thomaston Dam and appurtenant structures, Naugatuck River, Housatonic River Basin in Thomaston, CIVENG-19-016-58-46. $7,000,000-$8,000,000. Plans deposit $25. CD 1/30/57.

BUILDINGS—BA

▲ **Mass., Lowell**—INDUSTRIAL RESEARCH—BA 3/7—Commonwealth of Mass., Dpt. Educ., c/o Div. Bldg. Constr., 38 Chauncey St., Boston, E-812, Industrial Research Bldg. at Lowell Technological Institute. $1,655,000. Plans deposit $100. Krokyn & Browne, 184 Boylston St., Boston, archts. Bids Jan. 24, rejected. CD 1/29, under LB.

▲ **Conn., Danbury**—HOSPITAL—BA 3/14—Danbury Hospital, Locust Ave., (second unit) hospital addn., alterations, $1,750,000. Rogers & Butler, 219 E. 44 St., New York, N. Y., archts., Meyer, Strong & Jones, 101 Park Ave., New York, N. Y., engrs. CD 4/23/56.

HEAVY CONSTRUCTION—LB & CA

▲ **Berke Moore Co. Inc.,** 8 Newbury St., Boston, Mass., LB $2,696,900, Contr. 216, Chelsea Creek Headworks, North Metropolitan Sewer District, between Marginal St. and Maverick St. extension at Eastern Ave., CHELSEA, MASS. Commonwealth of Mass., MDC, Constr., Div., 20 Somerset St., Boston, Mass. Bids Feb. 13 CD 1/15.

BUILDINGS—LB & CA

▲ **O. D. Purrington Co., Inc.,** 49 Westminster St., Providence, R. I., LB $1,873,000, U-57-1, SCIENCE CENTER (second section), University of Mass., AMHERST, MASS. Commonwealth of Mass., University of Mass., c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Bids Feb. 14. CD 1/22.

▲ **E. H. Porter Constr. Co.,** 13 Wallis St., Peabody, Mass., LB $1,769,000, Regional JUNIOR HIGH SCHOOL, Endicott St., BOXFORD, MASS. Towns, Topsfield, Middleton & Boxford, c/o J. Harrison Holman, chn. Planning Comn., Main St., Topsfield, Mass. Bids Feb. 13. CD 1/10.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
March 13 New York
STREETS AND ROADS
March 6 New Jersey March 13 New York

BUILDINGS—BA

▲ **Pa., Waymart**—WARD—BA 3/26—General State Auth., 18th and Herr Sts., Harrisburg, 2 patient ward bldgs. at Fairview State Hospital. $1,500,000. Plans deposit $25. A. L. Wiesenberger Assocs., 527 Hamilton St., Allentown, archts.-engrs. CD 10/17/56.

▲ **Vt., Burlington**—POST OFFICE, COURT HOUSE—BA About 4/2—General Services Admin., Public Bldgs. Service, 19th and F Sts. N.W., Wash., D. C., 1 story, mezzanine, part 6 story bldg., approx 134,580 sq. ft. floor area, etc., U. S. Post Office and Court House, Elmwood Ave., Pearl St. and George St. (lease-purchase project). $2,710,000. Extended date. Freeman, French & Freeman, 158 Bank St., archts. CD 1/3.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dpt. P. Wks., Gov. Alfred E. Smith State Office Bldg., Albany, rejected bids Jan. 30, 0.45 mi. 6-lane divided elevated section of Cross Bronx Expressway between Clay and Fulton Aves. incl. 1,566 ft. viaduct between Webster and Third Aves. and 0.74 mi. work on various cross streets service roads, and access roads, incl. directional signs, lighting, drainage, playgrounds, utilities and roadside development, Bronx Co. LB $5,034,593. CD 2/5, under LB.

▲ **Stock Constr. Co.,** 70 E. 45 St., New York, N. Y., LB $6,782,000, Contr. No. 3003, demolition and removal of Piers 37, 38, 39, 40 and 41, and dredging, constr. substructure of new Pier No. 40, North River, Manhattan Boro, NEW YORK, N. Y. Comr. Marine & Aviation, Pier 1, North River, New York 4, N. Y. Bids Feb. 17. CD 1/28.

BUILDINGS—LB & CA

▲ **Avella Constr. Co.,** 215 E. 145 St., New York, N. Y., CA $1,802,000, general constr. CLASSROOM ADMINISTRATION BLDG. (Bldg. No. 2) at State University of New York, Harpur College, ENDICOTT, N. Y. Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany, N. Y. Bids Jan. 30. CD 2/4, under LB.

▲ **HRH Constr. Corp.,** 16 W. 46 St., New York 19, N. Y., CA $10,942,000, general constr. CRIMINAL COURTS BLDG. and PRISON, Queens Blvd., Hoover Ave., 132 St. and 82 Ave., Queens Boro, KEW GARDENS, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Grand total $16,634,317. Bids Nov. 27. CD 12/2, under LB;
A. Rosen & Son, 211 E. 117 St., New York 35, N. Y., CA $1.064,117, plumbing (Kew Gardens, N. Y.);
H. Sand & Co., 11 Park Place, New York 7, N. Y., CA $1,828,200, heating and ventilating (Kew Gardens, N. Y.);
Meyerbank Elec. Co., Inc., 126 W. 32 St., New York 1, N. Y., CA $2,800,000, electric (Kew Gardens, N. Y.).

▲ **Dick Co.,** Rte. 51, Large, Pa. LB $5,876,543, general contract AUDITORIUM with retractable roof, PITTSBURGH, PA. Pub. Auditorium Auth. of Pittsburgh and Allegheny County, 1046 Union Trust Bldg., Pittsburgh 19, Pa. Bids Feb. 18. CD 2/6;
American Bridge Co., 525 Wm. Penn Place, Pittsburgh, Pa. LB $3,985,000 structural work for dome roof (Pittsburgh, Pa.);
Limbach Co., 521 Pressley, Pittsburgh, Pa. LB $647,-831 aluminum covering for dome roof; LB $158,400 ice skating rink for arena (Pittsburgh, Pa.);
E. C. Ernst, Inc., 7025 Campania Ave., Pittsburgh, Pa. LB $1,989,890 electrical work (Pittsburgh, Pa.);
Wayne Crouse, Inc., of Pittsburgh, 245 N. Neville, Pittsburgh, Pa. LB $712,500 plumbing (Pittsburgh, Pa.);
American Seating Co., 1776 Broadway, New York, N. Y. LB $574,914 seating (Pittsburgh, Pa.);

▲ **Village Constr. Co.,** c/o Jerry Cerza, 16 Speir Dr., South Orange, N. J., Own Forces, $4,000,000, two 6 and 8 story APARTMENTS on Mountaintop Quarry adjacent to Newstead, South Orange Ave., SOUTH ORANGE, N. J., (Correction—owners address). CD 1/9, under CA.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 6 Kentucky

▲† **N. C., Cherry Point**—HOUSING—BA 3/25—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Bldg. N-26, Norfolk, Va., 849 Armed Services Housing, Marine Corps Air Station (NAVDOCKS 2296 (Rev. 5-57); NBy (CHO 10716, FHA Proj. 053-81023-MC-3). CD 9/17.

BUILDINGS—LB & CA

▲ **George A. Caldwell Constr. Co.,** 622 Neosho Ave., Baton Rouge, La. LB $2,430,294. HIGHWAY DEPARTMENT BUILDING, S.P. No. 600-01-19, State Capitol, BATON ROUGE, LA. Louisiana State Hy. Dpt., R. B. Richardson, dir., Hy. Office Bldg., Baton Rouge, La. Bids Feb. 14. CD 1/24.

▲ **Fluor Corp.,** 31-37 Old Spanish Trail, Houston, Tex., CA Est. $3,000,000, design and constr. 150 million cu. ft. per day Natural Gasoline PLANT to extract propane from natural gas south of NEW ORLEANS, LA. Tennessee Gas Corp., Commerce Bldg. and Texas Natural Gasoline Corp., Bank of Southwest Bldg., both Houston, Tex. CD 2/4.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
March 11 Wisconsin
STREETS AND ROADS
March 11 Wisconsin

▲ **Ill., Chicage**—MAUSOLEUM, etc.—BA 3/11—Oak Woods Cemetery, 1035 E. 67th St., mausoleum, columbarium, concrete paving. $5,000,000. Harley Ellington & Day, Inc., 153 E. Elizabeth St., Detroit, Mich., archt. CD 5/2/56.

BUILDINGS—BA

▲ **Ind., Bloomington**—MUSIC—BA 3/20—Bd. Trustees, Indiana University, J. A. Franklin, vice. pres., constr. School Of Music Bldg. addn., alterations, on campus. $3,000,000-$3,500,000. Plans deposit $125. Ammerman, Davis & Stout, K of P Bldg., Indianapolis, engrs. Daggett, Naegele & Daggett, Inc., 567 W. Westfield Blvd., Indianapolis, archts. CD 3/29.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus,
O.—**J. A. Jones Constr. Co., Charlotte, N. C.,** P. O. Box 18, Berlin Heghts, O., CA $3,952,216, est. $4,181,000 Proj. SR 1-7.56, ACI-1103 (26) Type T071 and structures 6.391 mi., Ashtabula Co.;
O.—**The Red Eagle Corp.,** 4479 Indianola Ave., Columbus, O., CA $3,194,447, est. $3,629,600, Contr. SR 1-0.00 33.31, ACI-1105 (34) Type T-35 and structures, 6.205 mi. Delaware and Franklin Counties;
O—**The Ohio Engineering Co.,** 105 Sixth St., Lorain, O., CA $874,427, est. $965,200, contr. SR 82-(4.79 12.47) F-602, Type T-35, and structures, 7.663 mi. Lorain Co.;
O.—**Maxon Contr. Co., Inc.,** 2600 Far Hills Ave., Dayton, O., CA $2,908,400, est. $3,259,000 contr. USR 25-15.88 ACI-1088, (3) City of Dayton, Type T-71 and structures, 2.185 mi. Montgomery Co. Grand total $10,929,490. CD 2/13. Bids Feb. 4, under LB.

Pump Operation and Maintenance

Shows plant operating and management personnel how to operate and maintain pumps used in industrial, municipal, central-station, marine, institutional, and similar installations. Every major class and type of pump is covered, with specific instructions for installing, starting up, routine operation, periodic maintenance, and major overhaul. **By Tyler G. Hicks, Mech. Engr., formerly Assoc. Ed.,** *Power.* **310 pp., 383 illus., $9.00**

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Condensed into this one book are all the tips, methods and techniques essential to more effective practices in industrial and construction operations—with the transportation and handling of heavy machinery—with the erection and demolition of smaller size structures. Covers everything from ropes, hoisting chains and hooks to slings and ladders. **By W. E. Rossnagel, Safety Engr., 2nd Ed., 342 pp., over 300 illus., $6.50**

PROFESSIONAL ENGINEER'S EXAMINATION QUESTIONS AND ANSWERS

Over 500 questions and complete answers to help engineers pass state license examinations. Covers mechanical, electrical, civil, and chemical engineering, and includes engineering economics and land surveying. Latest questions—suitable for all states. Author has worked on New Jersey examination preparation for 19 years. By William S. LaLonde, Jr., 462 pp., 234 illus., $6.50.

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New Way To Finish
CONCRETE CEILINGS

More and more building specifications require finely finished concrete ceilings. Because of this new requirement, Stow Manufacturing Company has developed the Stow CG Ceiling Grinder—a special machine designed to grind off form marks and fins, cut off nails, and smooth the entire surface.

With this machine, one man can average 4,000 square feet per day. Simple to operate, it pushes along like a baby carriage.

To operate the Stow Ceiling Grinder: (A) The operator first sets the pivot arm at about a 45° angle. He then adjusts the grinding disc to proper height by lifting up on the rubber-gripped handle in the center. A ratchet arrangement automatically locks it in position at the height desired. (B) A slight pressure is exerted on the grinding disc by the spring and chain assembly at the opposite end of the pivot arm. (C) A turn-buckle is used to get the most desirable angle for grinding. For ordinary grinding, the disc should be flat against the ceiling, but for cutting nails and removing fins it works better at a slight angle. A spring arrangement is built into the bearing housing to support the grinding disc and absorb any shocks, thus preventing any gouging. Once the machine is adjusted, the operator just pushes it along.

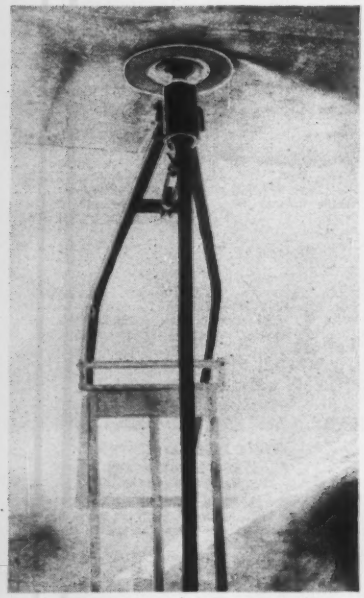
Three models are available:

CG 10—for ceilings 8 to 10 ft. high

CG 13—for ceilings 10 to 13 ft. high

CG 16—for ceilings 13 to 16 ft. high

STOW CG CEILING GRINDER



FOG OF CONCRETE DUST

All three models have a 1 HP totally enclosed motor operating at 3450 RPM. The disc is a 9" Bayflex of cotton fibrous material with a silicon carbide abrasive bonded with resin.

The Stow CG Ceiling Grinder can also be used for grinding walls. For this type work, employ the same flexible shaft as used on the ceilings, but attach a handpiece or anglehead to one end.

Stow Manufacturing Company also makes a complete line of portable electric flexible shaft grinders for both wet rubbing and dry grinding walls. For more information on the Stow CG Ceiling Grinder and a copy of Stow's Grinding Concrete pamphlet, which gives the proper speeds for both wet rubbing and dry grinding, contact your Stow distributor or send in the coupon below. Stow Manufacturing Company, Binghamton, N. Y., also makes a complete line of concrete vibrators, rotary trowels aand screeds.

STOW MANUFACTURING CO.
19 Shear St., Binghamton, N. Y.

Please send me Bulletin 5713 on CG Ceiling Grinders.

Name .....Title .....

Company .....

Street .....

City .....State .....

BUILDINGS—LB & CA

▲ **Carl M. Geupel Constr. Co.**, 1919 N. Meridian St., Indianapolis, Ind., CA Est. **$1,500,000**, 1 story, 40,000 sq. ft. brick pharmaceutical RESEARCH CENTER, ZIONSVILLE, IND., Pitman-Moore Co., 1200 Madison Ave., Indianapolis, Ind.

▲ **Corbetta Constr. Co., Inc.**, 208 S. LaSalle St., Chicago, Ill., CA **$4,926,168**, 2 story, 3 academic bldgs. each brick, HIGH SCHOOL, SW cor. Sibley Ave. and Cottage Grove, DOLTON, ILL. Thorton Twp. School Dist. 205, 151st and Broadway, Harvey, Ill. Samuelson & Sandquist, 7161 N. Cicero Ave., Lincolnwood, Ill., archt. CD 12/27.

▲ **Barton-Malow Co.**, 2631 Woodward Ave., Detroit, Mich., CA Est. **$10,000,000**, MEDICAL RESEARCH CENTER, 3 story, 130 x 330 ft. glass and aluminum LABORATORY; two story, 85 x 252 ft. ADMINISTRATION, 21,000 sq. ft. POWER PLANT, Plymouth Rd. near University of Michigan, ANN ARBOR, MICH. Parke, Davis & Co., Harry J. Loynd, pres., Joseph Campau at the River, Detroit, Mich. Bids Dec. 17. CD 12/4.

▲ **Beauty Built Homes, Inc.**, 8811 Puritan, Detroit, Mich., Owner Builds, **$1,500,000**, 100 face brick Ranch HOMES, Royal Madison Sub-division, MADISON HEIGHTS, MICH.

▲ **A. W. King Constr. Co.**, 5301 East Outer Dr., Detroit, Mich., Owner Builds, **$1,700,000**, HOUSING, Harper Beach Sub-division, Fierz Place and Metropolitan Hy., ST. CLAIR SHORES, MICH.

▲ **Klug & Smith Co.**, 4425 W. Mitchell St., Milwaukee, Wis., CA Est. **$3,000,000, $12,000,000** incl. equip. design and constr. ROLLING MILL, MANITOWOC, WIS. Mirro Aluminum Co., 1512 Washington St., Manitowoc, Wis. CD 8/15, under Aluminum Goods Mfg. Co., as owner.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
March 4 Iowa
STREETS AND ROADS
March 4 Iowa

▲† **Oklahoma**—BA 3/12—U. S. Eng., Box 61, Tulsa, Zone 2, 5,437 ft. two lane Willis Bridge over Red River, near Willis, Okla. connecting Texas and Oklahoma. $5,000,000. CD 12/24.

BUILDINGS—BA

▲ **Kan., Derby**—SCHOOL—BA 3/6—Derby Public Schools, Bd. Educ., Paul B. Cooper, supt Schools, Junior High School. $1,500,000. Hibbs-Robinson & Pettit, 254 N. Washington St., Wichita, archts. CD 10/23.

▲ **Tex., Austin**—OFFICE—BA About 3/15—Texas Employment Comn., 300 W. 6th St., 5 story, bsmnt. rein.-con. office bldg. $2,500,000. Plans deposit $100. George L. Dahl, 2101 N. St. Paul St., Dallas, Zone 1, archt. CD 2/5.

▲† **Mo., Grandview**—HOUSING—BA On Or About 3/26—Procurement Officer, Bldg. 541 (Base Theater Bldg.) Richards-Gebaur Air Force Base, const. 610 family type dwelling units Richard-Gebaur Air Force Base, No. 23-608-58-53. Approx. $11,500,000. Plans deposit $100. L. H. Geis, 7920 State Line, Kansas City, Mo. and G. H. Dahl & Assoc., 2101 N. St. Paul St., Dallas, Tex., archts. CD 6/25/56.

▲ **Okla., Tulsa**—HOSPITAL—BA 3/26—Wm. K. Warren Foundation, c/o Mrs. Wm. K. Warren, Warren Petroleum Corp., 1340 S. Boulder St., St. Francis Hospital. $8,000,000. Schmidt, Garden & Erikson, 104 S. Michigan, Chicago, Ill. and F. M. Olston, Nidco Bldg., assoc. archts. CD 1/7.

BUILDINGS—LB & CA

▲ **Chalmers & Borton**, 200 E. First St., Hutchinson, Kan., CA Est. **$2,000,000**, 500,000 bu. addn. to rein.-con., etc. GRAIN ELEVATOR, HUTCHINSON, KAN. Farmers Cooperative Comn. Co., J. H. Dean, genl. mgr., Hutchinson, Kan.

▲† **Southeastern, Inc.**, 7500 Sands Springs Rd., Tulsa, Okla., CA **$10,137,705**, 700-unit HOUSING, Altus Air Force Base, INV. 34-612-58-9, ALTUS, OKLA. U. S. Govt., c/o Base Procurement Office, Altus Air Force Base, Bldg. 320, Altus, Okla. Bids Dec. 19, awarded Jan. 28. CD 1/2, under LB. Procurement Office, Air Force Base, Altus, Okla., engrs.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAYS
STREETS AND ROADS
March 11 Idaho March 19, 26 California

▲† **California**—BA 3/13—U. S. Eng., 751 S. Figueroa St., Los Angeles, imprvs. Big Dalton Wash Channel Los Angeles Street to Walnut Creek Inlet Channel. ENG-04-353-58-12. $2,500,000. CD 10/24.

BUILDINGS—BA

▲ **Calif., Fresno**—RESIDENCE HALLS, etc.—BA 3/11—State Div. Architecture, 1120 N. St., Sacramento, three 3 story reinforced brick, masonry, concrete

(Continued on page 84)

SCREEDING *PLUS* PLANNING SPEEDS FLOOR FINISHING AT NEW I.B.M. OWEGO PLANT

Screeding 2-inch slump concrete with a STOW 25 foot vibrating screed.

Two STOW G46 Roto-Trowels follow the screeds to get final finish.

OWEGO, N. Y. Crow-Smith, contractors on the new $12,000,000 International Business Machines Corporation plant in Owego, N. Y., engineered the 175,000 sq. ft. manufacturing plant right down to the numbers, types and sizes of paving equipment to be used. Two 25 ft. Stow vibrating screeds were used to strike off the concrete. The floors were laid out in 25 ft. lanes, so that the same screed beam length could be used throughout the plant.

Crow-Smith saved considerable time by using a vibrating screed of this length, both in the actual screeding operation and in putting in the forms.

After screeding the 2-inch slump concrete, Crow-Smith used two Stow 46-inch Roto-Trowels to do the floating and finishing job.

Experience has proved that Stow screeds cut production time almost in half. Also, they strike off *stiff* concrete smooth and true to grade and vibrate it at the same time.

Stow offers quick delivery; screeds can be shipped within three days of receipt of order. Stow screeds are available complete, cut to any desired length, or the Stow package assembly without beam, consisting of 2½ HP vibrating unit, brackets for engine mounting, end rollers, handles and all necessary bolts.

For more information on Stow screeds, write—

STOW MANUFACTURING CO. **19 SHEER ST., BINGHAMTON, N. Y.**

Gurley | ***Current Meters for measuring stream velocity in:***

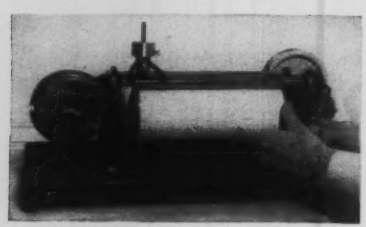
Fresh water—rivers, streams, canals, lakes

Salt or brackish water—with a newly-designed salt water model

Shallow or sluggish streams—with the Pygmy Current Meter

Industrial waste and sewage—where solids permit ...the Gurley Current Meter is made of non-corroding materials.

Gurley Current Meters have been the standard of the profession since 1870. Highly-standardized, easily-disassembled for cleaning...simple, precise and rugged. Write for "Gurley Current Meters" (Bulletin No. 700).



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Continuous record on graph chart for 24 hours or 8 days. Positive response to fluctuation by float, perforated tape and sprocket wheel. Finest quality "Chelsea" marine clock. Metal base and cover. Made of non-corrosive materials throughout. Ranges 1 to 40 ft., or 30 cm. to 12 meters.

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GURLEY

W. & L. E. GURLEY HYDRAULIC INSTRUMENTS DIVISION
UNION PLAZA, TROY, N. Y.

Gurley—Since 1845

(Continued from page 82)

residence halls and certain site development work at Fresno State College, W. O. 4005GC-6 $1,750,000. Plans deposit $75. CD 5/20.

▲ **Utah, Salt Lake City**—HOSPITAL WING—BA 3/11—Holy Cross Order of Catholic Sisterhood, Sister Olilia Marie, admin., 1045 E. 1st S., hospital wing. $2,000,000. John Meloney & Assoc., 754 Central Bldg., Seattle, Wash., archts. CD 3/15/56.

▲† **Calif., Lompoc**—BUILDING REHABILITATION—BA 3/12—U. S. Eng., 751 S. Figueroa, Los Angeles, rehabilitation of bldgs. at Cooke Air Force Base, ENG-04-353-58-40. $5,000,000. CD 3/5.

▲ **Calif., San Jose**—HOSPITAL—BA 3/12—Bd. Supervs., Santa Clara Co., Civic Center, 1st and Rosa Sts., third stage 194 bed hospital addn., alterations at Santa Clara Co. Hospital, $1,600,000. Stone, Mulloy, Marraccini & Patterson, 619 California St., San Francisco, archts. CD 7/22.

▲ **Calif., Artesia**—COLLEGE—BA 3/18—Cerritos Junior College Dist., 17923 S. Pioneer Blvd., Increment No. 2 addns. $1,500,000. CD 2/4.

HEAVY CONSTRUCTION—LB & CA

▲ **WASHINGTON**—State Hy. Comn., E. A. Cowell, chn., Olympia, Bids opened 2/18,
Morrison-Knudsen Co., Inc., 1519 Broadway, Boise, Idaho and **Rumsey & Co.**, 3821 Airport Way, Seattle, Wash., LB **$2,978,878**, extending Alaskan Way viaduct, Seattle, King Co. CD 2/4.

▲ **E. V. Lane Corp.**, 2675 Park Blvd., Box 417, Palo Alto, Calif. CA **$2,126,535** installing Pumping Units 7, 8 and 9 at 5 pumping plants on Colorado River Aqueduct, LOS ANGELES, CALIF. Metropolitan Water Dist., 306 W. 3 St., Los Angeles, 15, Calif. Bids Feb. 5, awarded Feb. 11. CD 2/10, under LB.

▲ **Peter Kiewit Sons Co., Fred J. Early Co.**, 345 Kieways Ave., Arcadia, Calif. CA **$3,191,000** effluent pumping plant at Hyperion Sewage Treatment Plant, El Segundo, LOS ANGELES, CALIF. City Bd. P. Wks., 153 City Hall, Los Angeles, Calif. Daniel, Mann, Johnson & Mendenhall, 3375 Wilshire Blvd., Koebig & Koebig, 3242 W. 8th St., Los Angeles, Holmes & Narver, 828 S. Figueroa St., Los Angeles, Calif., archts.-engrs. (joint venture). Bids Jan. 22, awarded Feb. 5. CD 1/28, under LB.

BUILDINGS—LB & CA

▲ **Phil Yousen**, 1500 Lincoln St., Venice, Calif. CA **$8,963,000** (17 bidders) ARMED SERVICES HOUSING consisting 725 family housing units at Luke Air Force Base, Inv. 02-604-58-10 PHOENIX, ARIZ. Base Procurement Office, Luke Air Force Base, Arizona. Bids Dec. 18, awarded Jan. 17. CD 12/31, under LB.

▲ **Ritter Roof Structures, Inc.**, 122 S. W. Stark St., Portland, Ore., CA Total est. **$2,000,000**. 500,000 sq. ft. WAREHOUSE, 23-acre site alongside Willamette River, PORTLAND, ORE. Waterways Terminals Co., 120 N. W. Front Ave., Portland, Ore.;
General Constr. Co., 4850 N. W. Front Ave., Portland, Ore., CA 1,278 ft. covered dock for loading and unloading facilities (Portland, Ore.).

▲ **Paul W. Speer**, 3425 Cahuenga Blvd., Los Angeles, Calif. LB **$2,228,000** (6 bidders) Parkman JUNIOR HIGH SCHOOL, Canoga Park, LOS ANGELES, CALIF. Los Angeles Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Feb. 14. CD 1/20.

▲ **M. H. Golden Constr. Co.**, 3485 Noell St., San Diego 1, Calif. CA **$1,408,000** 3 story, rein.-con. OFFICE, SAN DIEGO, CALIF. Union Title Insurance & Trust Co., 1028 2nd St., San Diego, Calif. Bids Jan 21. CD 1/17.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 6 Northwest Territories

BUILDINGS—BA

▲ **B. C., Prince George**—HOSPITAL—BA 3/19—Prince George Dist. Hospital, Prince George, 4 story, 50 x 300 ft., rein.-con. hospital. $2,000,000. Plans deposit $50. Thompson, Berwick, Pratt, 1553 Robson, Vancouver, archts. CD 12/9/55.

HEAVY CONSTRUCTION—LB & CA

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria,
Peter Kiewit Sons Co. of Canada Ltd., 2182 W. 12th Ave., Vancouver, B. C., LB **$2,157,282** (17 bidders), reconstr. section of Trans-Canada Highway between Boothroyd and Jackass Mountain, Proj. No. 906. CD 4/17.

BUILDINGS—LB & CA

▲ **Ball Bros. Ltd.**, 49 King St. E., Kitchener, Ont., LB **$1,686,500** (3 bidders) HOSPITAL and CHAPEL BLDG. No. 2 and ACCOMMODATION BLDG. No. 3, Eastern Penitentiary penitentiary site, 10 mi. Northeast of KINGSTON, ONT. Dpt. Justice, Penitentiaries Branch, Justice Bldg., Ottawa, Ont. Lt. Col. R. W. Catto, c/o owner, chf. engr.

▲ **Angus Robertson Ltd.**, 5035 Western Ave., Montreal, Que., CA **$3,000,000** (7 bidders) 7 story TOOL BLDG. extension, Belmont St., MONTREAL, QUE. Bell Telephone Co., 1050 Beaver Hall Hill, Montreal, Que. McDougal & Friedman, 1235 McGill College Ave., Montreal, Que., mech. engrs. Bids Jan. 14, awarded Feb. 12. CD 12/26.

(Proposal Advertisement see pp. 99 and 100)

NEW...

POWER-PACKED CHAMPS OF THE AIR-COOLED ENGINE FIELD

by HERCULES

HERCULES C2-90D
Design by Lycoming
35 HP; 274 pounds, dry

HERCULES CV4-180
Design by Lycoming
70 HP; 463 pounds, dry

No other industrial air-cooled engines pack the horsepower/pound of these two- and four-cylinder models. Modern design gives them 40-90% more HP per cubic inch displacement. Add to this high usable power, the economy of these engines . . . up to ⅓ in fuel savings over competitive engines . . . and you've got an unbeatable combination for your equipment power or power-unit applications.

The Hercules industrial air-cooled engines of Lycoming design have the dependability and endurance for which the Lycoming name is famous in aircraft engines. Crankshaft design is oversize and all bearings are of the replaceable type. With overhead valves, "top-overhaul" is fast and simple on these Hercules units; in fact, complete engine rebuild can be accomplished without removing the engine from its mountings.

Lubrication is by force-feed system with the oil fed from the crankcase to the engine's moving parts by gear-type pump through a pressure relief valve.

Available as engines or complete power-units, with accessory equipment to match service conditions, these engines have been refined by Hercules and are backed by Hercules reputation for quality, stamina and engineering excellence. Prompt service is available through Hercules world-wide distributor organization.

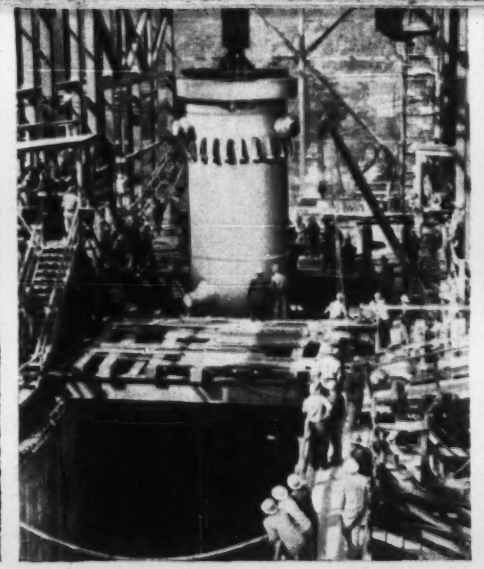
For further information, write Hercules Motors Corp., Dept. 100, Canton 2, Ohio. Other Hercules engines from 5 to 475 HP.

HERCULES

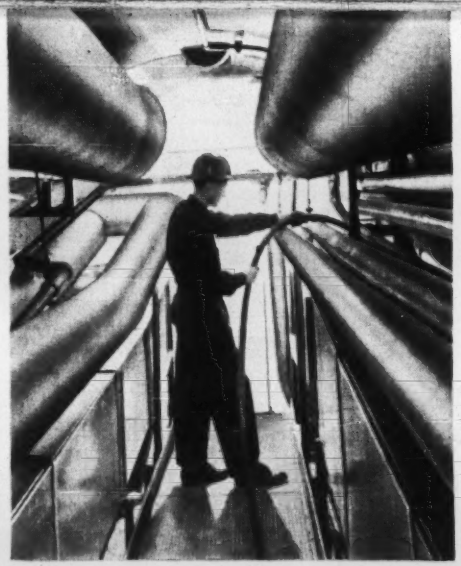
HERCULES MOTORS CORPORATION
Canton, Ohio

A Dravo workman is lowered into the stainless steel-lined reactor vessel at the Shippingport Atomic Power Station.

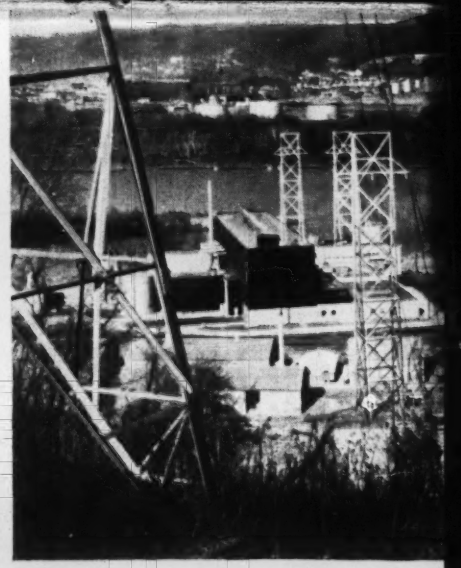
Early construction on waste disposal plant. It will handle all radio-active wastes originating in the atomic power plant.



Lowering 150-ton reactor vessel. Special field-designed suspension system positioned it with watchmaker's accuracy.



Typical portion of the 10 miles of piping (ranging from ½-inch to 18-inch diameter) installed in the reactor plant.



Plant went "on stream" December 18, 1957—and stayed "on stream"—a tribute to the men and companies who made it possible.

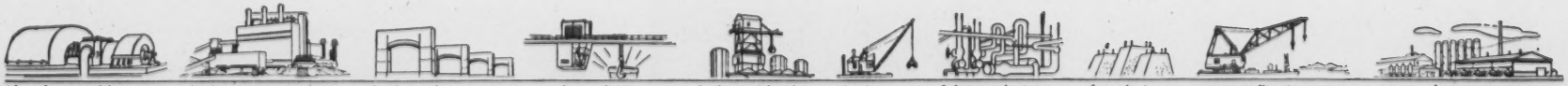
Dravo at work...Shippingport, Pa.

Dravo was selected more than two years ago to put together the vital nuclear system of the nation's first full-scale commercial atomic power plant. This part of the project required a force of 1100 men at the peak of construction. Dravo's responsibilities included installation of the reactor vessel, all mechanical and electrical equipment as well as fabrication and installation of complicated piping systems which form the "arteries" of the nuclear portion.

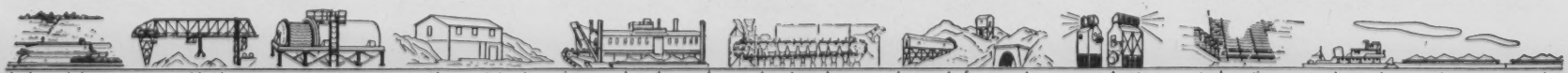
Now at full power and synchronized into the Duquesne Light System, the Shippingport project joins a long list of Dravo accomplishments in the field of special and difficult construction for industry and the nation. DRAVO CORPORATION, PITTSBURGH 25, PA.

At Shippingport, Dravo was a subcontractor to Westinghouse Electric Corp., which designed and developed the nuclear reactor under contract with the Atomic Energy Commission. Duquesne Light Company, in addition to providing the conventional portion of the plant, is operating the entire facility.

DRAVO
CORPORATION

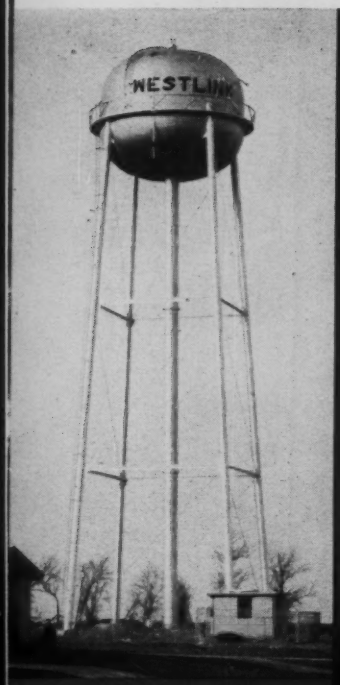


Blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping • foundations • gantry & floating cranes • gas & oil pumping stations

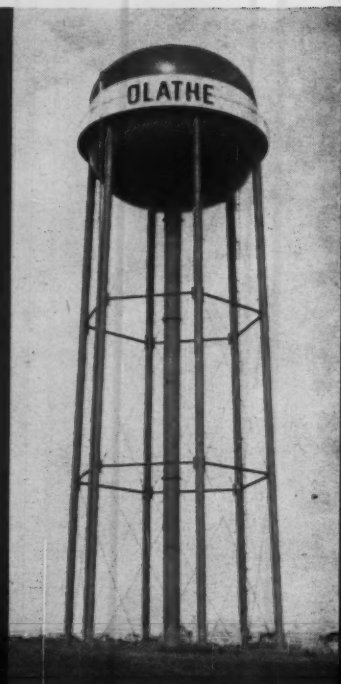


locks and dams • ore & coal bridges • process equipment • pumphouses & intakes • river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

KANSAS



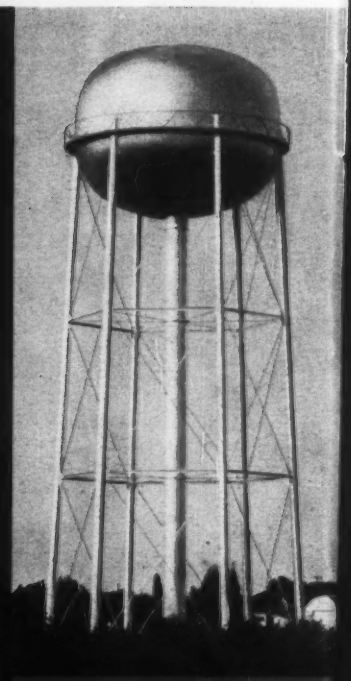
WICHITA
100,000 Gallons
Head Range 21'01"



OLATHE
250,000 Gallons
Head Range 30'10½"

WISCONSIN

RACINE
150,000 Gallons
Head Range 24'9¾"



NEENAH
300,000 Gallons
Head Range 30'09"

Some recent examples of Double Ellipsoidal in the very low head-range range

PDM
ELEVATED STEEL TANKS

The low range of head inherent in all PDM Double Ellipsoidal Elevated Steel Tanks is an advantage emphasized particularly in the capacities from 100,000 to 300,000 gallons.

• As illustrated in the installations above, you get low head range *plus* fine appearance in our Double Ellipsoidal design. Let us detail for you the important *economy* factors, as well.

Pittsburgh-Des Moines Steel Company

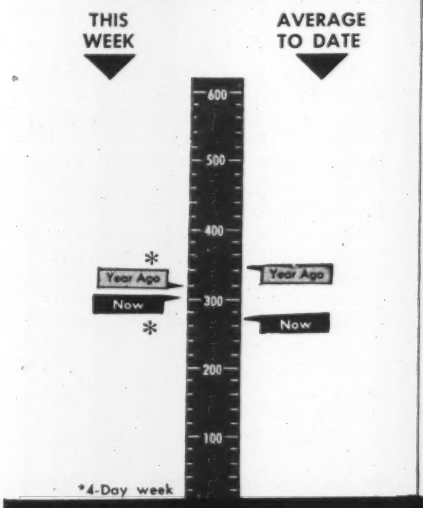
Plants at PITTSBURGH, DES MOINES, SANTA CLARA, FRESNO, and CADIZ, SPAIN

PITTSBURGH (25) .....3414 Neville Island
NEWARK (2).....1716 Military Park Bldg.
CHICAGO (3)...618 First National Bank Bldg.
EL MONTE, CAL.....P. O. Box 2012
ATLANTA (5)....361 E. Paces Ferry Rd., N. E.
DES MOINES (8).....915 Tuttle Street
DALLAS (1).....1219 Praetorian Bldg.
SEATTLE (1).....Suite 322, 500 Wall St.
SANTA CLARA, CAL.....621 Alviso Road
DENVER (2).....323 Railway Exchange Bldg.

Construction Scoreboard

ACTIVITY THIS WEEK

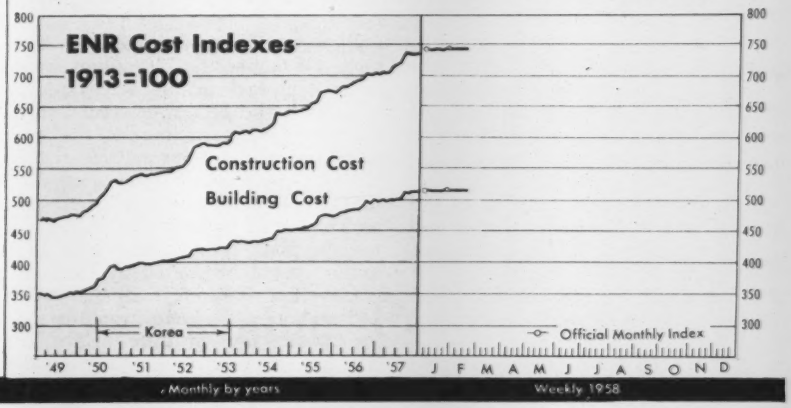
Contract Awards
Millions of Dollars



COST INDEXES AS OF NOW

ENR INDEXES (1913=100), 20-cities' average	Week of Feb. 20 1958	% of Change from Jan. 23 1958	% of Change from Feb. 14 1957
Construction Cost	743.81	+0.05	+5.0
Building Cost	515.82	−0.05	+2.9

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 9 wks 1958	Chge '57-'58
	millions		%
All Heavy Constr.	$304.7*	$2,433.6	−21
Private	128.2	1,134.3	−26
Public	176.5	1,299.3	−17
State & Municipal	132.2	1,035.7	−9
Federal	44.3	263.6	−37
By Type of Work			
Public			
Waterworks	3.3	34.9	−37
Sewerage	8.5	92.1	+30
Bridges†	19.7	68.1	−34
Highways	47.2	364.0	−23
Earthwork, Waterways	1.9	132.0	−35
Buildings, Excl. Housing	47.6	340.1	−7
Housing	43.9	196.8	+87
Unclassified	4.3	71.2	−63
Private			
Mass Housing	48.1	353.1	−26
Commercial	41.9	277.2	+26
Industrial	37.5	403.0	−42
Unclassified	0.8	101.1	−30

† Includes private bridges.

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

* 4-day week.

NEW CAPITAL FOR CONSTRUCTION

	Week of Feb. 20	Cum. 8 wks 1958	Chge '57-'58
	millions		%
Corporate Securities	$129.7	$809.9	−18
State and Municipal:			
All Except Housing	189.2	1,234.4	+54
Housing	...	1.0	−94
Federal Loans	0.8	39.3	+123
Federal Aid	...	....	...
Total Nonfederal	$319.8	$2,084.6	+15
Federal Appropriations:			
Projects in U. S.	...	....	...
Outside U. S.	...	....	...
Total New Capital	$319.8	$2,084.6	+15

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	Jan. 1958 (millions)	Percent Change from last Month	Percent Change from last Year
Total U. S. (ENR reported)	$112,004	+0.5	+6.3
By ownership—			
Private	47,297	+0.8	+6.7
State & Municipal	50,720	+0.3	+6.7
Federal	13,986	−0.1	+3.4
By Type of Work—			
Waterworks	2,425	+0.1	+7.8
Sewerage	3,395	+1.0	+5.4
Bridges	3,365	+1.6	+9.3
Highways	13,321	+1.1	+1.6
Earthwork, Waterways	12,272	−0.8	+8.1
Public Buildings	20,178	−0.1	+7.2
Industrial Buildings	16,667	−0.6	+2.9
Commercial Buildings	20,716	+2.3	+10.6
Unclassified, Private	9,914*	+0.1	+5.6
Unclassified, Public	9,749	+0.5	+5.4

*Includes private bridges, $88 million.

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1958 Jan.	1958 1-month	Percent Change from '57 Jan.	Percent Change from '57 Year Cum.
	(millions)			
Total U. S. (ENR reported)	$1,578	$1,578	−38.9	−38.9
By ownership—				
Private	784	784	−40.8	−40.8
State & Municipal	711	711	−40.6	−40.6
Federal	82	82	+39.0	+39.0
By Type of Work—				
Waterworks	19	19	−55.1	−55.1
Sewerage	93	93	+27.5	+27.5
Bridges	62	62	−57.4	−57.4
Highways	277	277	−53.2	−53.2
Earthwork, Waterways	10	10	−28.4	−28.4
Public Buildings	238	238	−22.8	−22.8
Industrial Buildings	58	58	−86.0	−86.0
Commercial: Mass Housing	244	244	−53.7	−53.7
Other Building	454	454	+89.9	+89.9
Unclassified, Private	28	28	−80.2	−80.2
Unclassified, Public	95	95	+15.0	+15.0

FLOW OF PROJECTS OUT OF BACKLOG INTO CONTRACTS

Total U.S. (ENR reported)	772	772	−7.1	−7.1
By ownership—				
Private	254	254	−9.7	−9.7
State and Municipal	447	447	+5.9	+5.9
Federal	71	71	−44.1	−44.1

Governors Urge More State Public Works

Follow-through by legislatures on construction spending could ease the industry's recession pains

The nation's construction industry would appear to be the one least likely to be grievously hurt by a continuing recession when balanced against gubernatorial budget recommendations to those state legislatures currently convening.

Early reports from a sampling of the 21 states whose lawmaking bodies are in session indicate that spending for construction is to be increased or at least be equal to that of last year. "Business as usual" apparently is the slogan of the governors, but few ignored the need for increased taxes to carry on programs authorized or new programs projected. It is quite obvious that the state governments, in company with the federal government, recognize construction not only as a prop to the economy at all times, but the weapon that can perhaps turn recession into prosperity or a reasonable facsimile of prosperity.

• **Into the red**—Many states, even without the benefit of increased spending recommendations, currently are dipping their fiscal toes into red ink. Where legislatures are in session, the governors have pointed the fact out. In a few states where legislative sessions are not regularly scheduled there have been suggestions that a special session be called. At least three governors have ordered a special session, and Maine recently adjourned a special session.

The urgings for the special sessions, however, are not based entirely on a condition of slipping revenue—or at least that reason is not publicly announced. But all have been founded on the generally declining economy. Once called and convened, such sessions could well turn into spending and taxation sessions.

• **Unemployment problems, too**—Such could be the case in Connecticut where Gov. Abraham A. Ribicoff has set next Tuesday as the first day of that state's special session. The governor will propose bond issues totaling $410 million to pay for highway and public works projects, he will also request modifications in the state's unemployment compensation laws.

Under the bond program, about $345 million would be earmarked for highways. Of that total, $270 million would go to highways in the interstate system, with the federal government reimbursing $243 million of the cost. State highway projects outside the interstate system would total some $210 million. This amount would be placed under contract by June 30, 1961. Without the bond authorization, only $135 million could be started by that date.

Governor Ribicoff said that about $65 million of the bonds would be used for construction at state institutions. The newest proposals would be in addition to $181 million in state building and highway construction authorized previously by the General Assembly.

Of $181 million authorized, more than $85 million covers state building projects. A large chunk of that amount may well go under contract before this year is ended. Right now, with only the weather standing in the way, close to $14 million is ready to be started, for Public Works Commissioner Timothy J. Murphy announced that that total will be started when "we get a break in the weather."

The $96 million remaining will go for highway construction. The governor has indicated that this work will be able to move now that the state's turnpike project is completed. With manpower tied up on the Connecticut Turnpike during construction, interior road work could not proceed as fast as the governor says now will be possible.

• **An exception**—Perhaps one exception to widespread promises of speeding or increasing state construction projects is noted in Florida. There the State Cabinet ordered a 10% cutback in appropriations for state buildings. But this cutback has a twist to it. Gov. LeRoy Collins said recent bids have been running about 10% below cost estimates and "I don't want state agencies and institutions to use the lower costs as an excuse to expand their plans."

Terry Lee, coordinator of state construction, enlarging on the governor's statement, said there is no guarantee the present favorable bid condition will continue. He added that the "situation exists only because contractors are hungry and not because labor and material costs are down."

But the state has abandoned one project temporarily at least—the development of a Capitol Center at Tallahassee. This move resulted from an unfavorable court decision on condemnation proceedings, however, and not because of money woes.

But Florida is not without its money troubles and if bid prices hadn't tumbled a genuine construction retrenchment possibly could have occurred. This possibility was announced by the governor last month when he said some public construction authorized would have to be curtailed because tax collections from the sales tax "have not come up to expectations" (ENR Jan. 9, p. 100).

• **Big spender**—Among the large states who can echo Governor Collins' statement on income is New York. Tax collections are $20 million below estimates. This did not appear to be a deterrent in budgeting for the new fiscal year starting April 1. Gov. Averell Harriman proposed a record-breaking budget of $1.8 billion, although estimated revenues for the same period were placed at $1.6 billion.

The difference, under the governor's proposals, would be made up by dipping $90.3 million out of accumulated reserves and by selling $123.7 million in bonds for programs that already have been approved by the state's voters.

Proposed expenditures are $142 million higher than those estimated for the current 1957-1958 fiscal year.

Of the total budget, $934.7 million would be for state contributions to local governments (of which a large portion eventually will find its way to construction on the municipal level), $254 million for new capital construction, and $599.1 million for normal state government operations. The latter figure represents an increase of $31.4 million over the current fiscal year.

Highways also will get a large chunk of money under Governor Harriman's program if enacted. He recommended record outlays of $480.2 million for this purpose during the new fiscal year, with $362.5 million going for construction. The remaining $117.7 million would be spent for maintenance, operation and safety programs.

To this proposed construction fund the federal government would contrib-

ute approximately $147.4 million.

The governor said that spending for actual highway construction will reach $326 million in this current fiscal year, a figure that was only $3 million short of the 1957-58 goal set by the temporary State Commission on Highway Finance as essential for a minimum program.

Although no tax increases were proposed formally with the exception of an end to the so-called state income tax "forgiveness" that has ranged to a maximum of $35 to individuals, the governor told the lawmakers that the state's expanded highway program would be jeopardized in the future unless the gasoline tax was boosted from four cents to five cents.

• **More highways, public works**—Also suffering an economic downturn is New Jersey, a condition that Gov. Robert B. Meyner has said should be counteracted with giant public works and highway construction programs.

Last week he followed through on earlier statements by recommending a record budget of $399.7 million for the fiscal year starting July 1.

Capital construction would claim $62.6 million, including $15.6 million for a new State Department of Education building. The latter would be the start of a $65 million bond program for expansion of the state's educational facilities that was requested by the State Board of Education.

Highways would get $80.7 million and this amount for construction would be swelled by approximately $58.4 million in federal aid under the federal highway program.

Governor Meyner's budget topped that of last year by $59.7 million and $33.1 million of the increase would be for expansion of higher education facilities and highway improvements.

• **Bigger tax bill**—The increased budget, however, was based on revenue that would be derived from new taxes or higher existing taxes. One of the candidates for a tax boost is gasoline and the governor urged a one cent a gallon hike in that levy, which is now five cents.

Governor Meyner also proposed a 5% net income levy on businesses, physicians and other professional persons, and farmers. As an alternative to this, he suggested a tax on corporate net income.

• **Cutback in California**—Gov. Goodwin J. Knight of California, who will vacate his office to run for U.S. Senator, proposed public works expenditures—including highways—totaling $457 million for the new fiscal year starting July 1. On the surface, this is a drop of only $13 million from the current fiscal year. However, $71 million of the expenditures proposed for the new fiscal year, would be spent for water development and this money request is contingent on legislative action on broad policy matters regarding water. This only can be done at a special session, which has not been called. For this year, there could be a stalemate on this subject, with only $6 million or so appropriated for engineering work.

Highways would claim $221.8 million of the $457 million as compared to the current fiscal year's budget of $245 million. Expenditures of $165 million were proposed for state buildings in the approaching fiscal year as contrasted to $200 million in the current year.

Governor Knight said the budget could be financed without increasing taxes. Highway construction money comes from gasoline and other motor vehicle taxes on a current basis and the state building program would use $130 million of a $200 million bond issue approved in 1956 for state buildings.

But to finance the entire budget, the state will have to draw from its $75 million reserve fund.

Banks' Lending Power Hiked

The Federal Reserve's Board of Governors last week announced a long-expected contribution to the easing of money: A cut in the amount member banks must keep on deposit at Federal Reserve banks. The ½% slice in reserve requirements, effective later this week and next, will free an estimated $500 million for loans and investment. Because commercial banks extend the bank's credit, rather than handing over cash, the $500 million theoretically can expand immediately available credit by $3 billion, the board calculates.

By moving to enlarge the volume of money available for loan, the board fulfilled expectations aroused last November and January when it cut the discount rate to make borrowing cheaper for member banks of the system. What followed then was an almost general drop in interest rates on bank loans. It is now thought that interest rates will edge down again once the effect of the board's latest move is widely felt. Though bankers are reluctant to admit this possibility, they agree that one outcome of the reduction in reserve requirements will be sharper competition to find customers for the new funds. And price cutting is one of the standby weapons of competition.

In circles outside the banks there was less hesitation on this point. A reduction in interest rates is "inevitable," asserted Aubrey G. Lanston, head of a New York investment firm bearing his name. The fresh supply of "money looking for investment" will eventually have a "pervasive effect on the interest rate structure of the entire market, including municipal bonds." Furthermore, government refinancing operations are likely to necessitate another cut in reserve requirements in the spring, he added.

The board's action will certainly "make money cheaper for municipal and state governments with public improvements to finance," commented Winfield Stephens, of Hemphill, Noyes & Co., New York investment house. But despite the predicted improvement in borrowing terms, neither Mr. Stephens nor Mr. Lanston expected to see bond authorities rush to the market with issues previously deferred because of high cost.

"Local and state governments that objected to the high cost of bond borrowing some months ago ended in most cases by coming in and paying the existing prices," Mr. Lanston said.

What the easier market may do, however, is strengthen the hand of local and state administrations that have talked of speeding up construction programs as a way of fighting unemployment.

The move comes at a time when business traditionally increases its borrowing for income tax purposes and the buildup of spring inventories. Its influence in expanding investment beyond these short-term plans is questionable. Having more and cheaper credit available doesn't itself stimulate investment unless industry believes there is reason to enlarge or modernize. And the reality behind the current slackening of business activity is that productive capacity has for a time caught up with demand. What easier credit can do about this situation is make possible a quicker recovery once the deeper trends in the economy reverse themselves.

(*B&F continued on page 92*)

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(Predraining Problem)

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Construction Markets

Jacksonville, Fla.: An On-the-Spot Report

"We have more work on our drawing boards now than we have had in several years," is the cheerful remark of a Jacksonville architect.

His statement reflects the general prosperity of the construction industry in this section of the Sunshine State. Architects, engineers and contractors in Jacksonville and surrounding Duval County are fervently hoping that the current construction boom in the area will continue for at least another two to three years.

Public works makes up the bulk of the major projects, but private construction—both residential and commercial—also will do well, judging from building permits issued recently and projects still in the planning stage.

Steady growth in population and industry has created the present construction market, and Jacksonville will be busy catching up with essential service and housing needs for a long period of time.

Since 1950, population in Duval County increased by 100,000 to its present level of about 400,000. Much of the new building for these residents has been in the unincorporated areas. Residential permits in 1957 totaled nearly $27.5 million in the county as against $19.8 million in 1956. Commercial permits in 1957 were almost $8 million.

There have been no large industrial starts in Jacksonville since the recent completion of a $40 million expansion for St. Regis Paper Co. and construction of a $2 million plant for Simmons Co., mattress manufacturer. But in 1957, about 40 small industrial companies, employing a total of approximately 1,000 persons, came into the city.

Spearheading the city's effort to catch up with the demand for services is a $30 million civic improvement program for which bonds already have been sold. A rough breakdown of the planned construction is as follows:

- Sewers and a treatment plant, $15 million. Plans were prepared by Metcalf & Eddy, Boston.
- New city hall, $6 million. Reynolds, Smith & Hills, Jacksonville, are the architects.
- City auditorium, $3.5 million. Kemp, Bunch & Jackson, Jacksonville, are the architects.
- Coliseum, $3 million. Eugene Cellar and George Ryan Fisher, both of Jacksonville, are the architects.

In addition, approximately $6 million will be spent for drainage and street paving. These items exceed the $30 million total for which bonds have been sold, but the difference will be made up by sale of city property, such as the site of the present city hall, reinvestment of bond funds and funds already in hand. Proceeds from the bond sale were delivered last month, and the city plans to request bids immediately on some phases of the total program, which is scheduled for completion in three years.

Many contracts still are to be awarded for the Jacksonville Expressway, scheduled for completion in mid-1960. Ultimate cost of the system, including acquisition of rights-of-way, will be about $90 million. Actual construction will total about $55 million, but so far only some 25% of the project is either finished or under contract. The state road department and the federal government have added funds to the project now that part of it is in the interstate highway system.

Final contracts will be awarded this year for a $3.5 million Navy ammunition storage facility at Cecil Field, just outside of Jacksonville.

Downtown Jacksonville is a busy hive of construction activity. Several blocks currently are being cleared for a $6 million retail store of Sears, Roebuck & Co. Bids for the building are to be taken about March 1. Just down the street work is moving ahead on the $5 million Robert Meyer Hotel. In the same area, work will begin soon on the 13-story office building of the Atlantic Coast Line. The first step involves bulkheading the edge of the site along the St. John's River.

A big project under study is a new municipal airport. The present municipal facility, Imeson Airport, is too small for traffic in the jet age and cannot be economically expanded. Right now ways of financing such a project are being considered.

Soon to be voted on is a proposal for a $17 million school construction program for Duval County. This will be in addition to a $5 million program already authorized.

Announcing the

ALFRED A. RAYMOND AWARD

An award of $1,000 will be given annually in honor of Alfred A. Raymond, inventor of the cast-in-place concrete pile and founder of Raymond Concrete Pile Company. It will be presented to the author of the best original paper on "Design and Construction of Foundations for Structures," as selected by a committee of eminent judges. Authors of manuscripts, to qualify, must hold a degree in engineering from an accredited institution.

The topic "Design and Construction of Foundations for Structures" is to be interpreted broadly. It covers all phases of foundation engineering from the initial planning to the final installation of a foundation for a structure. Engineers are cordially invited to submit a paper on whatever aspect of foundation engineering or construction of foundations will contribute to knowledge in the field. Manuscripts may deal with foundation test borings, soil mechanics, the theory of foundation design, actual foundation construction, either temporary or permanent, and other related subjects. *All papers must be submitted by September 1, 1958.*

If you are a practicing engineer, engineering faculty member or a graduate student and wish to compete for this award, simply write for a complete set of detailed regulations: Dept. E-3, Alfred A. Raymond Award, Room 1214, 140 Cedar Street, New York 6, N. Y.

Engineering Unions Form Federation

Engineers and Scientists Guild covers professional, technical employees; stresses collective bargaining

A long search for a stronger and more effective collective bargaining voice for engineering and scientific employees, both professional and nonprofessional, culminated last weekend in the formation of Engineers and Scientists Guild.

ESG, formed as a national federation of collective bargaining organizations, is expected to have 5,000 professional civil engineers among the 23,000 employees represented for collective bargaining purposes by the 10 organizations that sponsored its birth and that may become its charter members.

The founding convention was held in the Shelburne Hotel, New York City, February 22-24.

Charles N. Hall an electronics engineer who heads the Engineers Association at Sperry Gyroscope Co. on Long Island, N. Y., was elected interim president.

ESG's first convention will be held in Southern California six months from the date that two-thirds of the proposed member units have ratified the federation's constitution.

• **Its nature**—The new federation is unique in two respects.

Unlike Engineers and Scientists of America, an established union for engineers from which ESG was spawned as a splinter group, the federation will include unions serving the professional and economic needs of both professional and nonprofessional employees. And it will make full—and even militant—use of the collective bargaining process as the effective tool to achieve its aims.

Representing a broadside attack on the professional society attitude toward unionism—that professionalism and unionism are incompatible—ESG emphatically subscribes to the belief that "members of the engineering and scientific community" must "organize in economic association" for both their own and society's well-being.

As stated in its constitution, ESG's primary reason for existence is this: "As employees, we can advance ourselves economically and give rightful dignity to our occupational pursuits and status by bargaining collectively with our employers and by representing the engineering and scientific community before the general public and governmental agencies."

Structurally, ESG is a federation or national association of autonomous collective bargaining units somewhat similar to the organization of the AFL-CIO.

To be eligible for membership in ESG, however, a local or regional unit must exist primarily for organizing, representing and bargaining collectively for employees in some branch of engineering, science or allied technical field.

• **Its shape**—What ESG will look like when the work of the founding convention is implemented is best obtained from a look at its founders.

The organizations that have guided its birth and that may become its charter members as and if they ratify the constitution are these:

• Engineers and Scientists of California, which bargains with the Western Association of Civil Engineers and Land Surveyors, with Pacific Gas and Electric Co. and, through its Bay Area Chapter, with four well known soil and foundation engineering firms, including Woodward-Clyde & Associates.

• Civic Center Chapter of Engineers and Architects Association, which embraces the Flood Control District of the County of Los Angeles, the Department of Water and Power of the City of Los Angeles, and the County of Los Angeles. Members of these groups are predominantly professional civil engineers.

• Metropolitan Chapter, EAA, which represents employees of the City of Los Angeles, 75% to 80% of whom are civil engineers.

CHARLES N. HALL elected interim president of Engineers and Scientists Guild.

• Railway technical engineers, whose representation includes employees of Northwest R.R.

• Aircraft Chapter, representing Lockheed employees.

• Engineers Association—Sperry.

• Southeast Chapter, EAA, representing employees at Rheem Manufacturing Co.

• Technical Association of Ward Leonard.

• San Diego Chapter, EAA, representing employees at Convair.

Attending the convention, in addition to these, as an observer that may or may not decide to affiliate, was the Tennessee Valley Authority Engineers Association, whose valley-wide president, incidentally, is a hydraulics engineer who is a member of the American Society of Civil Engineers.

One of the significant aims of ESG, after it completes its permanent organization, is to induce other units to affiliate and to assist member units in organizing unorganized employees. Possible targets already mentioned include the presently existing Illinois Highway Engineers Association and engineering and technical personnel on the payroll of Bechtel Corp.

Some indication that ESG looks forward to a positive, progressive, and, if necessary, a militant existence, is reflected in a constitutional provision authorizing creation of an "emergency fund" through which ESG can aid member units engaged in strikes or other emergency proceedings.

• **Objectives**—ESG has in mind a number of approaches to its principal task—promoting the economic and professional interests of its members.

Those stated in its constitution include collective bargaining assistance to member units; serving as a spokesman for engineering and scientific employees before the public and state and federal agencies; promotion of legislation favorable to employees; preparation and dissemination of various types of information and statistical data on personnel problems, including professional standards and salaries; and promotion of programs, such as insurance and pension plans, for individual security and welfare.

During the founding convention sessions, these were reduced to more concrete terms and a list of immediate ob-

jectives drawn up. That program, on which it looks as if formal action will not be taken until the first convention, embraces these ESG services: coordination of the efforts of affiliates toward the common goal; publicity; public relations; leadership training; a statistical clearing house; organizing; assistance in negotiations; emergency and other financial assistance; job placement and relocation; and advancement of professional standards and ethics.

• **Why?**—What is some of the thinking behind ESG? Basically, it's protection—protection of the individual as an employee, his personal dignity, his economic interests, his professional standing.

According to ESG President Hall, engineers need a national organization if they are going to be organized at all. Membership in a trade union, he believes, is not beneath their dignity but represents piece-meal organization that fails to realize the full potential of unionism.

Some form of unionism, he says, is essential. The bulk of the nation's engineers are employees and through mass employment has come a tendency to subject engineers to rules and regulations applicable to production employees to the engineers' economic and professional detriment.

Answer, Mr. Hall asserts, is unionism for those employed in engineering, science and allied technical fields. Only through unionism with collective bargaining as the enforcement machinery, he says, can employed engineers protect themselves as individuals, achieve the economic and professional recognition they should have, and develop and promote their professional standards.

On the issue of professionalism, Mr. Hall had this to say: "It is my conviction that professional standards can be advanced only through collective bargaining. Professionalism and unionism are therefore not incompatible. Unionism is a necessity."

It is this emphasis on collective bargaining, this identity of interests among employed engineers and scientists and allied technical employees, this common concept of the necessity to organize and to unite in a single federation that sets ESG apart from ESA and from the AFL-CIO.

When the founding convention wound up on Monday, ESG seemed well on its way to becomoing another significant voice in labor-management relations.

(*Labor continued on page 98*)

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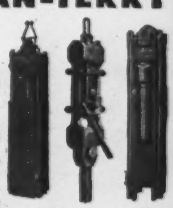

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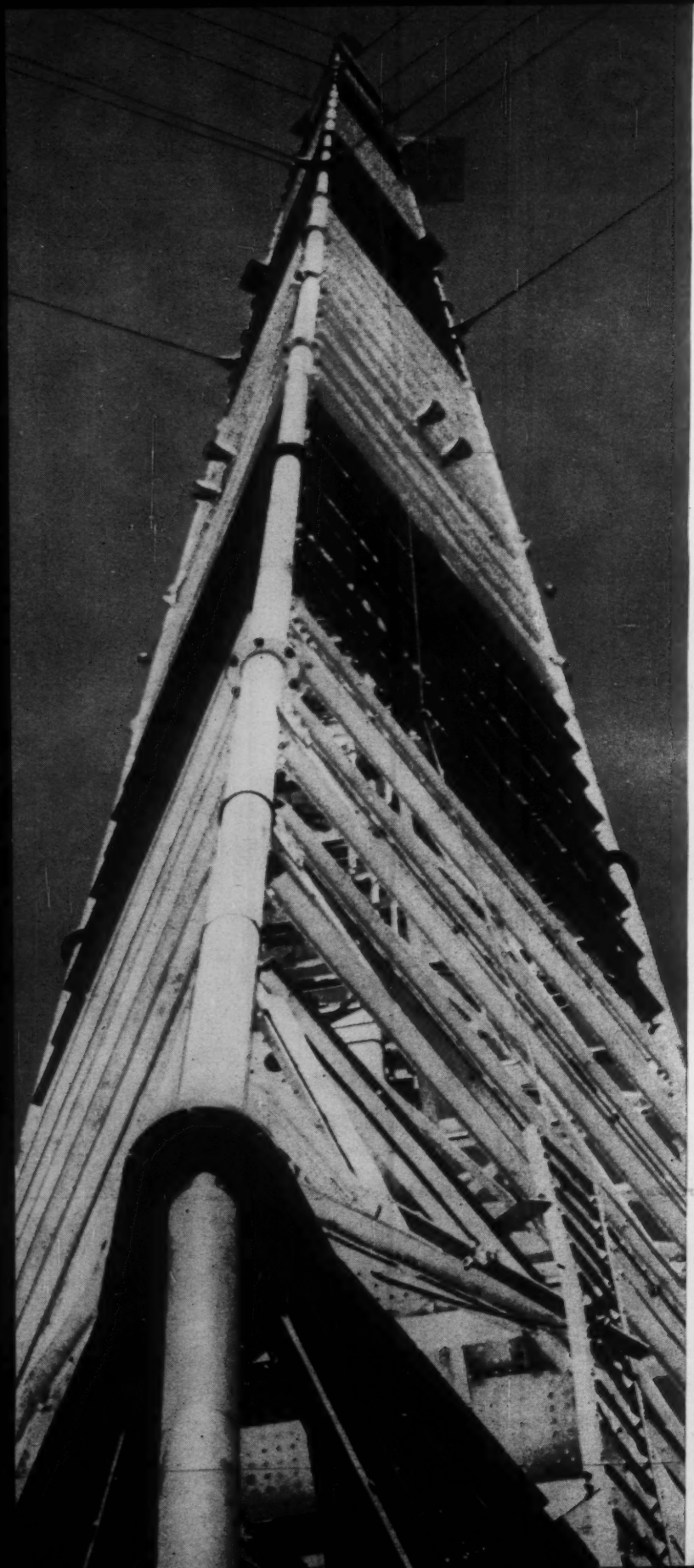
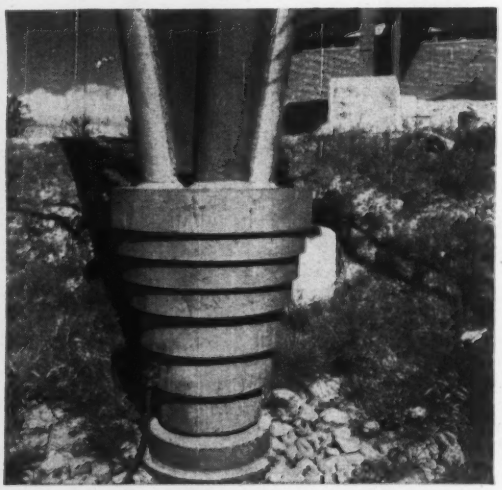
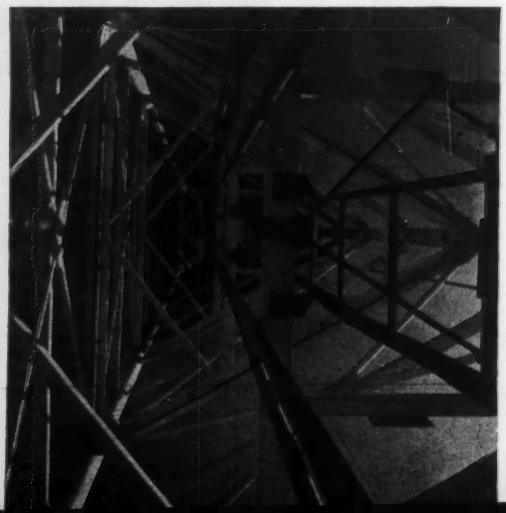


USS cuts



3,000,000 pounds of pressure are concentrated at the tower base. This includes the weight of the tower and guy lines plus the downward pull of the guy lines. USS "T-1" Steel, used in the solid bar legs, carries this load.

44% smaller legs were possible because of the great strength of USS "T-1" Steel. Cost reduction: 15%.



"T-1" Steel cost 15%

in 1,199-foot TV Tower

THIS is the new 1,199-ft. WBZ-TV transmitting tower near Boston, Massachusetts. It's unique because up to the 838-ft. level its legs are of USS "T-1" Steel, a constructional alloy steel so strong it made possible significant savings for the tower owner. This structure was designed and built by Dresser-Ideco for Westinghouse Broadcasting Co.

WBZ's tower presently supports a 6-bay channel 4 antenna, but future plans call for it to carry plenty of additional weight; pending FCC approval, another 300 feet of height will bring it to an ultimate 1,499 feet. The tower had to be built with the strength to accommodate this extra weight without the necessity of future structural modifications.

Round, hot-rolled, heat-treated bars of USS "T-1" Steel were used for the three legs up to the 838-ft. height because this alloy steel has nearly three times the yield strength of structural carbon steel. It therefore enabled Dresser-Ideco to reduce the size of the legs greatly, lowering shipping weight, welding costs, wind stresses and over-all weight and price. For example, consider the leg members at the bottom of the tower. Cross-sectional area of these "T-1" bars is only 56% of the area required with the usual structural carbon steel, resulting in a 44% material savings. Also saved: the cost of hot forging and machining, since carbon bars of the size required for the biggest members are too large to be produced economically by hot-rolling. *Altogether, the builders estimate that "T-1" Steel cut the cost of this tower by 15%.*

• • •

For more information on USS "T-1" Constructional Alloy Steel, contact any office of United States Steel (listed in all phone directories), or write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. For details about the column strength of "T-1", write us for our booklet on the subject.

United States Steel Corporation, Pittsburgh · Columbia-Geneva Steel Division, San Francisco
Tennessee Coal & Iron Division, Fairfield, Ala.
United States Steel Supply Division, Warehouse Distributors, Coast-To-Coast
United States Steel Export Company, New York

USS "T-1" CONSTRUCTIONAL ALLOY STEEL

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UNITED STATES STEEL

A Ban on Boycotts

Refusal of one union to handle goods of another is outlawed by AFL-CIO

The boycotting of an AFL-CIO union-made product by another affiliate of the federation has been banned by the Executive Council of the AFL-CIO.

Taken this month in Miami, the action represents a victory over the building and construction trades unions by the Reuther-McDonald forces in the federation. And it directly affects situations that have occurred in the construction industry, such as refusals of sheet metal workers to install ventilators made by steelworkers at the Akron, Ohio, Burt Manufacturing Co.

The AFL-CIO resolution provides that "No affiliate of the AFL-CIO shall engage in any boycott cessation of work, or refusal to transport, install or otherwise work on or with materials which have been manufactured or processed by workers represented by any other affiliate."

Although the mandate is a policy declaration without binding enforcement machinery, it has been so tied to the federation's constitution and no-raiding agreement as to make it a persuasive edict.

The AFL-CIO takes the view that such boycotts violate the constitutional mandate that each affiliate respect the integrity and established collective bargaining relationships of other affiliates—a principle that is also established by the no-raiding agreement. The boycotts thus become a violation of the no-raiding provision.

Using this approach, the federation has ordered that such boycotts be submitted to the impartial umpire—David L. Cole—under the no-raiding agreement. Since that agreement is still a voluntary one, however, the umpire will issue recommendations rather than decisions in those cases where the boycotting union has not already signed the agreement.

Among the unions that have refused to participate in the no-raiding agreement are six from the building trades—sheet metal workers, carpenters, laborers, iron workers, operating engineers and boilermakers. (The now-ousted teamsters were also a non-signatory of the agreement.)

If Mr. Cole's recommendations are not complied with, the dispute under the new procedure will be referred first to President George Meany and then to the AFL-CIO Executive Council.

In the past, Walter Reuther, who heads the federation's Industrial Union Department, has demanded a new constitutional provision banning such boycotts. Leaders in the building trades have denied that the boycotts involve raiding and have urged resistance to any effort to ban them. At best, the new approach is a compromise and an experiment in the long, slow road to labor unity.

JOSEPH DELANEY, new president of the operating engineers, and . . .

MAURICE HUTCHESON, head of the carpenters, keep building trades close to . . .

Labor's War Against Corruption

Leaders in two of the building trades unions have caused the AFL-CIO to gain and lose ground simultaneously in its efforts to free the trade union movement from the stigma of corruption.

On February 14, Joseph Delaney of New York succeeded ailing 77-year-old William Maloney as president of the International Union of Operating Engineers and immediately started a clean-up campaign within the union.

Four days later, three international officers of the carpenters union were indicted in Indianapolis on bribery charges.

The change in the operating engineers' leadership, effected by the union's Executive Board, came on the heels of a Senate Select Committee investigation into charges of corruption in the union. Mr. Maloney had resigned for reasons of health after the probe was launched.

Mr. Delaney, a former New York State Federation of Labor vice president and international secretary-treasurer of his union, already has asked for a report on the long trusteeship of two Chicago locals and has directed the union's Local 3 in San Francisco to recover funds alleged to have been misappropriated by former officers. He's also attempting to get a Long Island local to put to a vote of its members this week the question of reinstating three members ousted after they had attempted a local clean-up campaign of their own.

Named in the Indianapolis indictment are three top officers of the carpenters union—Maurice Hutcheson, president; Frank Chapman, treasurer; and O. W. Blaier, vice president. The bribery charges involve a former state highway official and the acquisition of land for highway purposes.

Use of Force Account On Roads Is Opposed

A Kentucky legislative proposal that would permit use of state highway employees on road jobs costing less than $25,000 has run into opposition from the Kentucky State Federation of Labor.

The labor group contends the measure would deprive construction workers of jobs, put many small contractors out of business and undermine the state prevailing wage law.

Under present law, state highway workers cannot do road construction work except where satisfactory bids cannot be obtained.

The proposed bill also would permit use of state workers in building roads on state owned property, on access roads for new industries and on emergency construction work.

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OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10:30 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY.

Bids: March 18, 1958.

Contract BP-120.011

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
PIER 11
BOOSTER PUMP STATION

Sealed proposals for the construction of a booster pump station at the site of new Pier 11 at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, March 18, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, February 27, 1958

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Its distribution among the contractors of any one state is in proportion to the number of contractors situated in that state. The Official Proposal Columns of *Engineering News-Record* offer precisely the same efficient service to municipalities, counties, state and federal departments in every section of the United States.

Bids: March 25, 1958.

Contract BP-140.008

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
PIERS 1 and 2
PAVING AND UTILITIES

Sealed proposals for the construction of pavements and utilities for Piers 1 and 2 at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, New York, until 2:30 P.M. on Tuesday, March 25, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

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THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, February 27, 1958

Bids: March 25, 1958.

Philadelphia, Penna.
Procurement Department
Water Department

Sealed bids will be received in Room 313, City Hall Annex, until 2:30 P.M. (E.S.T.), on Tuesday, March 25, 1958, and opened at that time, for Bid No. 2972—Contract No. S-2258.

Main Relief Sewer in 22nd Street from a Point 100.24' S. of S.H.L. of Seybert Street to a Point 20' N. of N.H.L. of Berks Street.

PRINCIPAL ITEMS OF WORK

This project includes approximately 3100' of 13' diameter concrete sewer in rock tunnel. The location is a built up area in Philadelphia.

Proposal forms, questionnaires and specifications may be obtained from the Water Department, in Room 1132, City Hall Annex, Juniper Street and Filbert Street, Philadelphia 7, Penna. Blueprints of plans may be purchased at bidder's expense, directly from the Keystone Blue Paper Company, 1230 Arch Street, Philadelphia 3, Penna. No bids will be received unless bidder is qualified by the Procurement Commissioner. The questionnaire form with all questions fully answered must be filed with the Water Commissioner, 1113 City Hall Annex, at least one (1) week prior to the date of opening bids.

Each proposal must be accompanied by security in form and amount as set forth in the proposal form.

OFFICIAL PROPOSALS

Bids: March 13, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 13th day of March 1958, by Henry A. Cohen, Director Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, 65 Court St., Buffalo, N. Y.						
Erie	FINTC 58-1 NTC 58-2	Interstate Route 506–N. Y. S. Thruway Niagara Section–Subdivision N-6, Part 2 (Porter Ave.–Ontario St.) Project I-865(16)	0.48 (0.30) (Acc.)	9" Cem. Conc. Pavt. 2 @ 24' Wide 0.67 Asph. Conc. Pavt. = 0.07 Mi. Misc. Work = 0.04 Mi. Including Reinf. Conc. App. Struct. 520.8' Reinf. Conc. Depressed Struct. 1313.4' Pedestrian Overpass–W. F. Beam 83.8' Span	$350,000 Plans $20	$8,333,000
DISTRICT No. 6, J. H. THOMAS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Tioga	FASS 58-3	Owego–Nichols, C. R. 602 Project S-87(2)	0.30	Asphalt Conc. = 0.30 Mi. Prestressed Beam Bridge 2 Spans Total 100.5'	$7,500 Plans $2	$135,000
DISTRICT No. 8, K. G. RAUER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Rockland	TAGS 58-1	N. Y. S. Thruway–Hudson Sect.–Subd. 8A Connection to Garden State Parkway (Grotke Road)	0.03	Miscellaneous Work = 0.03 Mi. Including Bridge– Triple Reinf. Conc. Box 38' Total	$1,700 Plans $2	$31,000
Ulster	FESS 58-5	West Shokan–Peekamoose–Sundown Road, C. R. 139 Project ER-77(2)	0.10	Bit. Macadam Pavt. = 0.10 Mi. Including Comp. I Beam Bridge 61' Span	$6,500 Plans $2	$117,000
DISTRICT No. 10, M. E. GOUL, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Nassau	NSPRC 58-1	Northern State Parkway (Contract 2) (Long Island Expressway to Hillside Avenue)	2.07	Widening & Resurfacing Cem. Conc. Pavt. with Carbon Black 2 @ 48' Var. 1.12 Mi. Asph. Conc. Pavt. = 0.87 Mi. Misc. Work = 0.08 Mi. Including Lengthening H. G. S. (Willets Road) Reinf. Conc. Arch 65.3'	$90,000 Plans $3	$1,660,000
Bronx	FICBE 58-2	Cross Bronx Expressway, Cont. 6, (Clav Avenue to Fulton Avenue) and Various Cross Streets and Service Roads. Project I-U-1084(30)	0.45 (0.74 Acc.)	9" Cem. Conc. Pavt. with Carbon Black; 2 @ 39' Var. Width . . . = 0.38 Mi.; Sheet Asphalt Pavt. . . . = 0.69 Mi.; Granite Block Pavt. . . . = 0.05 Mi.; Misc. Work = 0.07 Mi.; Viaduct Comp. Plate Girders 1566.8'	$320,000 Plans $20	$5,863,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: March 10, 1958

Youth Center Building

Sealed proposals for Building, Mechanical, and Electrical Work for the Youth Center Building, Dearborn Civic Center, Dearborn, Michigan, will be received by the City of Dearborn, Michigan, at the office of the City Clerk in the Municipal Building, Michigan Avenue and Schaefer Road, until 2:00 P.M. March 10, 1958 and will immediately thereafter be publicly opened and read aloud.

One award will be made for building, mechanical, and electrical work.

The contract documents are on file and may be examined at the office of the Architects and Engineers during business hours. Copies of the documents may be obtained by depositing at the Architects and Engineer's office cash or check in the amount of $30.00, which amount will be refunded if the complete documents are returned in good condition within 10 days after the opening of bids.

Proposals must be submitted in the form provided therefor by the Architects and Engineers. A certified check or a cashier's check payable to the City of Dearborn, Michigan, in an amount not less than 5 percent of the base bid, shall be submitted with each proposal, subject to the conditions set forth in the Instructions to Bidders.

The accepted bidder will be required to execute performance and lien bonds, each for the full amount of the contract.

No proposal may be withdrawn for at least 60 days after the scheduled closing time for receipt of proposals.

The City of Dearborn reserves the right to waive any informality in any bid, or to reject any or all bids, in whole or in part, should it be deemed for its best interests so to do.

CITY OF DEARBORN, MICHIGAN
JOSEPH CARDINAL
City Clerk

Harley, Ellington & Day,
Architects and Engineers
153 E. Elizabeth St.
Detroit 1, Michigan

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NEW YORK 36: P. O. BOX 12
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SAN FRANCISCO 4: 68 Post St.

POSITIONS VACANT

Graduate Civil Engineer or Architect for permanent position with long-established national organization. Technical and promotional work; cover Pennsylvania. Car furnished. Summary should include experience, education, salary requirement, etc. P-7194, Engineering News-Record.

Estimator—Cost Engineer—experienced in highway, structures desirable. Permanent position with medium sized growing Ohio General Contractor. P-7267, Engineering News-Record.

Help Wanted: Ontario County. Assistant Engineer. $4900.00. Also, Engineering Aide, $3600.00. These exams. open to eligibles nationwide. Exams. March 22, 1958. Last date for filing applications Feb. 28, 1958. Applications and further information available at office of Civil Service Commission, Court House, Canandaigua, New York.

Designers, Bridge and Highway—3 years experience in Consultant's Office. Send resume P.O. Box 752, Providence, R. I.

POSITIONS VACANT

Village Engineer, capable of directing Public Works for Village of Monona. Population 7000. Must be Registered Engineer. Salary Open. Apply: Village Administrator, Village of Monona, 5211 Schluter Road, Madison 4, Wisconsin.

Construction Man Wanted. Sixty year old well-known construction and engineering corporation operating in central New York desires to locate a thoroughly qualified all-around construction man who is able to prove himself and is qualified to become a fourth partner within one year. No capital is necessary but must be immediately responsible and good at supervision, subcontracts, estimating, expediting, cost-keeping, record-keeping, etc. Initial position will be to take over most of such detail work now being handled by President. Must be around 35 years old and a graduate civil engineer. P-7289, Engineering News-Record.

Wanted: Assistant Project Irrigation Manager for 60,000 acre project, capable of taking over management in six months to a year. Qualifications: Graduate C.E. Engineer or experience equivalent; experience in construction, design, operation and maintenance or irrigation works, hydraulic and electric pumping plants, heavy maintenance equipment and familiar with Irrigation District and Bureau of Reclamation policies. For application forms and further information contact the Board of Control, Lower Yellowstone Irrigation Project, 124 West Main, Sidney, Montana.

(Continued on following page)

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P. O. Box 12, N. Y. 36, N. Y. March 13th issue closes March 3rd

WANTED

CIVIL and SANITARY ENGINEERS

Qualified by training and experience to serve as resident engineers on water and sewerage construction. Must be registered, or qualified for registration. Also qualified inspectors for Ohio municipal projects.

FLOYD BROWNE and ASSOCIATES
125 West Church Street Marion, Ohio

SALES REPRESENTATIVE

or dealers wanted to sell concrete saw blades direct to road-builders and general contractors. Tremendous repeat sales . . . high commissions . . . provide an exceptional opportunity if you are now selling to concrete paving contractors. Submit complete data including territory covered. All replies confidential.

RW-7347, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS VACANT

(Continued from opposite page)

Opportunity for young Civil Engineer with actual experience in highway engineering. Career connection with National Organization having continuing interest in highway engineering, research, and construction. Give full details first letter. P-7291, Engineering News-Record.

Wanted—Prestressed Concrete Engineer. Experience in design, production and sales promotion preferred. Facilities are in process of construction, and as a subsidiary of large corporation, will expand with the market. Send experience resume, references, starting salary and availability for a personal interview. P-7292, Engineering News-Record.

Wanted—Centrifugal Pump Designer and Engineer to develop new line of products. Small company located middle Atlantic states. Give full particulars and experience first letter and expected salary. P-7324, Engineering News-Record.

Highway Field Engineers, two needed for route survey, one capable of supervision multiple parties. Specific experience State Highway work in this capacity is essential. Other experience and ability in highway and municipal engineering design are highly desirable. Write giving resume, references, salary desired and date available. Arthur W. Gillespie, Box 51, Birmingham, Mich.

Engineer or architect experience in field supervision. Commercial, industrial or mass housing. Experience in contract supervision and purchasing, also administrative details. Younger man preferred desirous of associating with growing organization offering possible future participation. Experience, salary, references. P-7236, Engineering News-Record.

ASSISTANT SUPERINTENDENTS OR FOREMEN

Two or three assistant superintendents or foremen required for company in midwest. Must have engineering background capable of maintaining precise construction records and handle group of thirty men. Mostly transmission line work. Must be good pushers for work in field and have good construction and engineering background. Top opportunity with large company. Permanent salary to $10,000 for right party. Reply with full details to:

P-7248, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ESTIMATOR WANTED
GENERAL CONSTRUCTION

Must be familiar with take-off, pricing, purchasing, subcontracts. Excellent opportunity. General Contractor located near Chicago. Reply fully covering experience, personal data, and salary requirements.

Write: P-7254—Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS VACANT

Civil Engineer with field experience on concrete structures, grouting, foundations, concrete design and estimating. Frequent travel. Nationwide contractor. P-7309, Engineering News-Record.

Estimator Wanted—Plumbing, Heating, Mechanical Piping. Top notch, experienced man. Salary commensurate with experience and ability. Permanent position. Liberal company benefits. Air conditioned office. Submit full resume of experience to Charles Simkin & Sons, Inc., Att: S. Simkin, P. O. Box 471, Perth Amboy, N. J.—Phone Hillcrest 2-7300.

Engineer—With Heavy Construction Experience. Young man (under forty) with "punch". Give complete resume of experience. Salary depends on employee's qualifications and initiative. Construction firm established upstate New York—municipal contractor. Apply P-7376, Engineering News-Record.

Contractor's assistant, graduate engineer, capable estimator, purchasing, to help manage a growing construction company now doing 1½ million dollar volume. Salary dependent upon experience. Location Philadelphia, Pennsylvania area. Send complete resume and salary required. P-7364, Engineering News-Record.

Architectural draftsman for office with school and church jobs to plan. Experience preferred preparing detailed plans, structural steel design, specification writing, job supervision. Permanent position for qualified man. Write P. O. Box 31, Lancaster, Ohio, giving qualifications, experience and salary, or call Lancaster 01 3-4316 for appointment.

Young man for engineering and estimating by well established general contractor doing sizable jobs in commercial and industrial field. Location—Central Pennsylvania. Give full details covering education, experience, references, salary and personal data. P-7386, Engineering News-Record.

Want Concrete Plant Supervisor familiar with Johnson Automatic Central Mix Plant. Please furnish references, education, experience and salary requirements. P-7387, Engineering News-Record.

POSITIONS VACANT

Assistant Engineer, 26-40, graduate, eligible for registration in New Jersey. Experience in surveys, sanitary design and municipal engineering. Permanent. Starting salary $6,500. Location: Central New Jersey. P-7392, Engineering News-Record.

Chief estimator needed long established heavy construction corporation Pittsburgh area. State all qualifications and salary requirements. P-7383, Engineering News-Record.

Heavy Construction: Bookkeeper and Time Keeper. Submit qualifications including education and references. Must be available for interview. Reply to M. K. Craig, 121 North Main Street, Wharton, New Jersey.

Electrical Engineer—Supervision of electrical maintenance, preparation of contract specifications for electrical construction and equipment. Large medical research center desires applicants who have an electrical engineering degree from an accredited college plus 3½ years professional experience. Salary $8645 plus the opportunities, fringe benefits and protection of the Federal Civil Service Merit System. Send resume of experience and education to Personnel Officer, National Institutes of Health, Bethesda 14, Maryland.

Engineer. Graduate, civil and structural, experienced. Design complex steel structures, reinforced and prestressed concrete. Permanent. Midwest location. Will pay moving expenses. Salary open. P-7240, Engineering News-Record.

POSITIONS WANTED

Superintendent or Estimator thoroughly experienced and qualified to handle all phases of job from bid to completion: Sewage and Water Treatment Plants, Power Plants, Building Const., Bridges, Foundations, Cofferdams, Piling, Reinforced Concrete. PW-7010, Engineering News-Record.

Canadian Consulting Engineer, civil, seeks short term foreign jobs. Salary or fee basis. PW-7025, Engineering News-Record.

Project Manager—seeking position leading to top management or participation in ownership. Age 32, married. Grad. C.E., Lic. Prof. Engr. NYS. 8 yrs intensified experience in Gen. Constr., Thorough knowledge bid to completion, used to heavy responsibility and have fine record of successfully completed projects, currently employed. PW-7220, Engineering News-Record.

Civil Engineer, 33. European educational background, German degree, 8 years exp. U. S. & Europe, Bridge & Highway construction, management supervisor design. Desires permanent position with stable progressive firm only; domestic or foreign. PW-7287, Engineering News-Record.

Project Manager or Superintendent for architect or contractor 30 years experience industrial, commercial, chemical, plant; airfield air base and missile base also highway and sewer construction. Available immediately. Stateside or overseas. PW-7274, Engineering News-Record.

Consulting Civil-Hydraulic-Irrigation — and Drainage Engineer available for foreign assignments varying from one month to six months duration. Professional Record-Rates of Pay and References Furnished to Interested Clients. PW-7241, Engineering News-Record.

Superintendent — Highway construction, grading, bridges and pavement. Complete charge of projects. Reply PW-7269, Engineering News-Record.

(Continued on the following page)

HIGHWAY ENGINEERS

SURVEY – DESIGN – STRUCTURAL

Offices

South Bend, Ind. East Lansing, Mich. Wheeling, Ill.

Benefits

Company pays Hospital Insurance, including dependents, vacations, Profit-Sharing-Retirement Plan. Low Personnel turnover. Salary advancement periodically with your advancement in ability.

CHAS. W. COLE & SON

220 W. LaSalle Ave. South Bend, Ind.

POSITIONS WANTED
(Continued from preceding page)

Architectural civil spec. writer inspector, graduate engineer, ten years experience. PW-7272, Engineering News-Record.

Construction Manager: 15 years sound experience. Exec. Ability, Engineering and Field Supervision, Estimating, Expediting. Industrial and Power Plant Building Construction and Mechanical Installations from customer contact to completion of projects. Desire permanent connection with Engineering and Construction Firm or expanding Utility. PW-7263, Engineering News-Record.

Carpenter-Gen. Foreman-Asst. Supt. 15 yrs. exp. Bridges, Buildings. Now available. Will Relocate. PW-7316, Engineering News-Record.

Supervisor. Pipe Installation. Construction. Refineries, Chemical, Power Plants. Local, Foreign. PW-7306, Engineering News-Record.

Mechanical Supt., asst. Job Supt. Industrial, Chemical, Power Plants, Refineries. Age 42—South, Southwest, Foreign. PW-7300, Engineering News-Record.

Sales Manager, 45, Construction Equip. making change from national industrial wheel and crawler manufacturer. Twelve yrs. experience earth moving equip. sales management both manufacturer and dealer level. Will consider either opportunity. Univ. degree, best references, will relocate. PW-7325, Engineering News-Record.

Registered Professional Mechanical Engineer —BSME: MSME: ME Degrees—Age 36—12 years diversified experience in Process and utilities for Industrial Plants with Design, Supervisory, Administrative and Field duties and overseas experience and languages. Presently employed as Senior Engineer by a leading company, seeks long range or permanent overseas or South American position with Europe preferred. PW-7334, Engineering News-Record.

Superintendent (carpenter) Formwork, reinforced concrete, bridges, hospitals, railroad terminals, schools, treatment plants, 11 years general construction supervision experience. Age 35. Will locate Los Angeles California vicinity. PW-7388, Engineering News-Record.

Civil Engr., B.S. 29. Single seeks responsible position in South America. 5 years experience heavy construction, design, and field work in S.A. and U.S.A. Fluent Spanish and English. PW-7331, Engineering News-Record.

Construction Engineer Superintendent on Industrial, Commercial, Bridge Projects desires change. Presently employed as General Superintendent of all company projects. Prefer Far West or South West, permanent location. PW-7360, Engineering News Record.

Structural Engr. registered, 30. Experienced in building design, steel and concrete, lift-slab. Desire responsible design with Southern consultant, preferably Fla. PW-7361, Engineering News-Record.

Mechanical Supt. 20 yrs experience just returned from 3 years overseas. Wishes another overseas assignment, top references. PW-7363, Engineering News-Record.

POSITIONS WANTED

Civil Engineer, Surveyor, Computor, Chief of Party, New Jersey registration, 20 yrs. highway, sewers, water lines, industrial & real estate developments. Will travel. PW-7366, Engineering News-Record.

Construction Supt.—BSCE, 40, 20 years exp., now employed, desires job with general contractor. Field supervision, scheduling, labor relations, cost analysis, direction of subcontractors on industrial and chem. plants and public buildings. PW-7356, Engineering News-Record.

Civil Engr., BSCE, Reg. in Pa., 31, 8 yrs. divers. exp., 3½ foreign, on const., design, estimating, layout of indust. bldg., railroad, earthwork, etc., seeks position in warm climate, pref. Florida. Pres. Salary 8,000 plus. PW-7369, Engineering News-Record.

Architect, project manager, and bldg. maintenance supervisor wishes position with multi-plant corporation, own practice 5 years, experienced in plant design, construction and multi-building maintenance supervision. Age 34, resume on request. PW-7378, Engineering News-Record.

Construction Supervisor, age 41, CWO CEC US Navy Retired. Thoroughly experienced in handling skilled, unskilled and foreign national personnel in the construction and maintenance fields. Desire responsible position, preferably overseas. Will be available in July. References. Resume on request to Box 683, Oak Harbor, Wash.

Salesman. Thoroughly experienced, executive-type. Steel, steel products, building and construction materials, government, background. Also, executive and administrative sales experience. Age 46. Located in Cleveland, Ohio. Seeking genuine sales opportunity. Will travel and relocate. PW-7384, Engineering News-Record.

Project Bridge Engr., 31, graduate, P.E. 9 yrs. bridge design exp., So. New England or Mid-Atl., Available April. PW-7389, Engineering News-Record.

SELLING OPPORTUNITY WANTED

Sales Engineer; graduate; age 27; experienced selling pre-fabricated buildings seeks position similar field; South preferred. RA-7270, Engineering News-Record.

WORK WANTED

Surveying field parties experienced, fully equipped. Contract or per diem, licensed. WW-7196, Engineering News-Record.

Structural drafting, shop drawings, computations, models, perspectives. Alexander's, 310 Turner Place, Ithaca, N. Y.

WANTED

Anything within reason that is wanted in the field served by Engineering News-Record can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

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McKee has permanent openings at their Cleveland, Ohio, offices for men with at least 3 years' experience in any of the following:

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Broad diversification of work in our 3 engineering divisions assures you security of employment.

Send detailed resume to
G. VICTOR HOPKINS

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

WANTED

SANITARY ENGINEER

With ten years experience. College graduate. Qualified for registration. Experienced in water and sewage plant design. Salary in five figures for the right man.

Floyd Browne and Associates
125 West Church Street Marion, Ohio

SUPERINTENDENT

General Contractor will add to expanding organization man qualified for large projects run independently of main office. Should be thoroughly experienced in both field supervision and estimating to handle smaller jobs, as is sometimes necessary, with minimum of field help. Man wanted is not the "Project Manager" type, but one not afraid of the hard work required to meet costs on lump sum contracts. Well paid and continuous employment. Work generally in Eastern half of this country. Give full resume in reply, particularly records of cost and schedule compliance.

Blount Brothers Construction Company
P. O. Box 949 Montgomery, Alabama

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Design, specifications, contract drawings, for all types of simple, continuous, and long span bridges. Tight time schedules met. Professional Engineers. Bridgeway Associates, 127 Liberty St., N.Y.C.

BUSINESS OPPORTUNITY

Business for sale—Industrial Construction Co. southwest Pennsylvania. Thirty-three years continuous operation, large clientele. Complete spread of modern equipment—Ideal opportunity for one or more engineers to form own operation or for large concern to open branch in this district. Complete description sent to interested parties. BO-7357, Engineering News-Record.

FOR RENT

For rent approximately 7000 square feet in new building. Long Island City, windows on four sides, air conditioning and private elevator available, reply FR-7277, Engineering News Record.

NEW PRODUCTS WANTED
Well-known midwest construction equipment manufacturer with complete production and merchandising facilities will pay well in cash or royalties for new construction products. Write:
BO-7144, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

Accurate *Confidential*
ESTIMATORS LTD.
Professional Construction Estimators
Complete and Competitive Estimates, Preliminary Estimates, and Change Orders. Nation Wide.
Main Office—3450 West 43rd St
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FOR RENT
3900 MANITOWOC LIFTCRANE
Only 9 months old—in excellent condition—70 ton capacity—160 foot boom—30 foot jib—torque convertor and manual control—located in western Pennsylvania—will move anywhere on long term lease.
STANDARD STEEL SERVICE, INC.
P. O. Box 929, Johnstown, Pa.
Phone 37-8451 or 37-7901

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One-Ton
ASPHALT PLANT,
complete with tanks
$25,000.00
THE W. I. CLARK CO.
New Haven, Conn.

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TENSIOMETER

TRADE NAME DYNAMOMETER

Measures Traction, Tension, or Weight

A PRECISION INSTRUMENT WHERE QUICK TESTS FOR SAFETY ARE ESSENTIAL.

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5" DIAL
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To determine strengths of: Bondings ● automobile and aircraft frame and cross piece buckling ● chain and cable ● earth anchors ● draw bar testing hydraulics ● clutch loads ● hardware fixtures ● tractor and truck load pulls.

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10,000 LB TEST
$59.00
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Complete with case, illustration of construction, and instructions for uses

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BLOWER — HOLE DRILLS

Two 80 ton and one 25 ton G. E. Diesel-Electric Locomotives. Like new—built 1955. 42" track gauge, will alter to suit.

One Ingersoll-Rand Motor Blower, Type FS—never used.

Four Blast Hole Drills, Bucyrus Erie 42 T Electric, with accessories. In good operating condition.—Bargain price.

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Lansford, Pennsylvania
Lansford 1619

SALE — RENTAL
1957 Koehring Model 305
Three-quarter yard crawler combination shovel-clamshell-dragline with General Motors Diesel Engine, 65-ft. boom, 24 in. shoes, 90-day warranty, $27,000.00
FRANTZ EQUIPMENT COMPANY
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GReenwood 7-7200

LORAIN Model 820
1½ Yd. Shovel, 30-ft. Boom, 27-ft. Stick, Cat. Diesel Engine. Good Condition, Reasonably Priced.
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Current Models Sale or Rent
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Sauerman Tautline: 600' span, rated capacity 2 tons, 2-45' timber towers, offered complete, less hoisting engine. Now located eastern Pennsylvania. New condition.
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1201 Lima Dragline, 80', 3½ yd.
65 Bay City Shovel, 1¼ yd.
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D-7 Cat Dozer
TD-18A International Dozer
AD-3 Motor Grader
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200 Amp. Lincoln Arc Welder
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Sullivan Core Drill, Hyd. Rotary Type, Complete with 210 Ft. "A" Rod & 60 Ft. "N" Rod, "A" & "N" Core Barrel, Diamond Core Bits, Carbide Bits, etc. Mounted on New Dodge Tandem Truck W/Power Steer, Drill Rig Self Contained W/Built in 500 Gal. Water Tank. Model 106 McCarthy Vertical Rock Drill W/Augers & Tools.
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New Hossfeld Prospect Drill—Never Uncrated Shovel Front for 1201 Lima, 3 yd., Good Condition.
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Gainesville, Fla.
Ph. *Franklin 2-2357*
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Prospect, Pa.
Ph. 2302

FOR SALE
1—New RCA metal detector—10" x 36" Aperture
1—Fuller-Kinyon System
1—Ingersoll-Rand Type XCB Air Compressor—(1245 Cu. Ft. per min.)
12—New Well Drill Bits—3¼" x 4¼"—7 API Joints
3—29-T Bucyrus-Erie Blast Hole drills
2—42-T Bucyrus-Erie Blast Hole drills
3—250 KVA Indoor transformers, GE Type A, Form L, 2300 Volt, 230/460, Serial Nos. 1625148-150-151
2—Pennsylvania Class DE-2 Compressors, Air Cylinder 20 x 12 1299 C.F. free air per min. displacement with motors
1—Ingersoll-Rand, PRE-22X14X16, 1721 Approx. C.F. per min. piston displacement with motor
1—Ingersoll-Rand XCB-2, 17 x 10½ x 14, 745 C.F. per min. with motor
1—4' x 6' Kennedy Van Saun double deck vibrating screen, Heavy Duty, Type "B"
1—Waukeshaw Industrial 6-cyl. gasoline Engine—Model 6—MZRU1U8031, Unit No. 29942 with twin disc clutch
3—GE Transformers Type H, Form SP Cycles 25, Capacity 150 Killowatts, Volts 1100/2200—244/488
1—Kennedy Van Saun Crusher No. 49½, Model 802 with 75 H.P. motor, Ser. No. 1351
1—Second-Hand Spider for above crusher
1—Second-Hand Drop Ball (3200#)
1—Kennedy Van Saun Crusher No. 49 with 100 H.P. motor, Serial No. 1387

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Complete ASPHALT SPREAD

1 Used Barber-Greene 848 continuous mix asphalt plant oil and gas burners, rubber mounted, electric powered, 4-compartment cold feeder, rotary vane fines feeder, hydraulic controlled discharge, asphalt pump. Plant has run total 262,000 tons since new, excellent maintenance. Has had all modifications and repairs, cleaned and painted. Condition excellent. Ready to go to work.
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F.O.B. Cars Tulsa, Oklahoma $99,800.00
This spread sells new for approximately $205,000.00 WILL SELL ALL OR ANY PART

SUPER PUSH TRACTOR

1 Used LeTourneau-Westinghouse Twin C pusher; powered with 2GM 6-71 Diesels (416 HP); mounted on 4-29.5 x 29 tires; 2 power shift transmissions w/torque converters, weight 81,000#; the most powerful pusher in use today.
F.O.B. Cars Okla. City, Oklahoma $26,500.00
Sells new for approximately $51,000.00.

B TOURNAPULL

1 Used LeTourneau-Westinghouse Model B tournapull 18 yd. to 25 yd. scraper; 300 HP HBIS 600 Cummins Diesel; mounted on 4-27:00 x 33-30-ply tires. Good Condition
F.O.B. Cars Okla. City, Oklahoma $29,800.00
Sells new for approximately $54,000.00

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1 Demonstrator LeTourneau-Westinghouse C Tournapull 13 to 18 yd scraper; power shift transmission and torque converter; 200 HP Cummins Diesel; 4-24:00 x 25-24-ply tires; 150 total hours
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Subject to Prior Sale
All Above Equipment in Excellent Condition
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4—Euclid 23TDT—3 years old—excellent rubber. G. M. 6-110 Engines, Allison Torque Convertors.
2—TS 300 A.C. Scrapers—Overhauled & ready to go.
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No Reasonable Offer Turned Down

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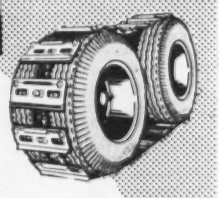

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Save up to 50%!

CLAMSHELL BUCKETS

14—2 yd. P.M. Model AB-1XE Hi Power ex. hvy duty, 1½" lips and 1½" bowl. Wt. 12,700# ea.
10—2 yd. Haiss gen. pur. hvy duty. 6400# ea.
6—2 yd. McCaffrey Mdl DLM, ex. hvy construction. 7320# ea.
5—2 yd. Erie Mdl X06, hvy duty, wt. 7505# ea.
1—2 yd. Yaun gen. purpose, 6816#.
1—2 yd. B.K. Mdl 724H gen. pur, wt. 6700#.
(All above fitted with teeth and extra cwt.)

DRAGLINE BUCKETS

2—2 yd. Yaun Dragline buckets, med. duty, solid shell. Wt. 4200# ea.
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(All unused—in perf. condition. Prompt shipment.)

ECA

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DRAGLINE
KOEHRING Model 801, Buda Diesel, 3 Yd. Page Bucket, 80' Boom.
Machine in A-1 Condition. Reasonably Priced.
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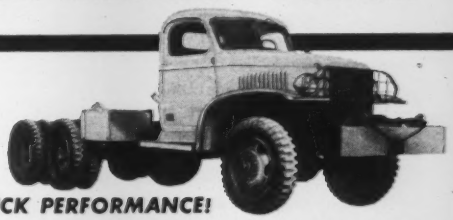

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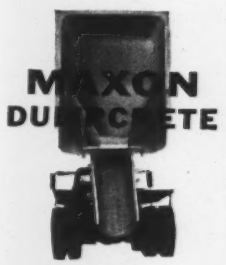

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Water System Lessons

JERSEY CITY'S WATER EMERGENCY—a mysterious leak in the distribution system that could not be located for 36 hours (ENR Feb. 20, p. 25)—could have at least two salutary effects.

In the first place, the nation-wide publicity accorded a near shutdown of a city whose water supply was endangered caused people everywhere to be reminded forcibly that water is indeed the lifeblood of a community. The result could be that waterworks officials will get a more sympathetic response to requests for funds needed for improvements.

But just as important, the Jersey City incident may spark new resolves on the part of waterworks officials themselves to be better prepared to cope with sudden emergencies.

In these days of tight budgets, scarce personnel and increasing responsibilities, some water departments may have put aside the preparation and checkout of disaster procedures because of the seemingly never-ending rush of day-to-day "emergencies." Such vital matters as the designations of crews and sequences for isolating various sections of the distribution system and periodic checking on functioning of key valves may have given way to the daily press of routine activities. This is a mistake, as the Jersey City experience suggests.

Construction and Missiles

THE CONSTRUCTION INDUSTRY is contributing to the dawning missile age. This is obvious from the amount of construction effort involved to date in the Air Force program (see p. 21). And it is obvious that there will be many more opportunities for architect-engineers and constructors to participate in design and construction of missiles facilities such as at Cooke Air Force Base, p. 30.

The Air Force program includes development of what are surely among this country's most important weapons systems—intercontinental ballistics missiles. There have been only a few test firings of the first ICBM—the Atlas missile—but confidence in the ultimate success of the weapon is shown by the investment of millions of construction dollars in operational facilities. Add to this, other millions to be spent by the Army and Navy on facilities for the missiles for which they are responsible, and a construction program of considerable magnitude emerges.

Rocket hardware—about which one hears the most—is developed by teams of experts in propulsion and guidance systems. But the structures that store and move the hardware about, and point it skyward, play a not insignificant part in U.S. missile progress, and are the responsibility of the construction industry. Development of more advanced missiles will mean new plants, new test facilities and new operational facilities. It will be up to the construction industry to continue to provide these vital foundations for our missiles.

Where We're Not Behind

MISSILES COMMAND THE ATTENTION of engineers and construction men for another reason than that of providing the necessary support facilities for their manufacture, testing and use. Russia's success in using a powerful missile to put the first earth satellite into orbit has triggered popular fears that the U.S. is being left behind in all branches of technology.

Such fears need to be allayed, and engineers and construction men, who know that they are not even remotely justified, could perform a useful service by bringing the situation back into perspective whenever the opportunity offers. This is all the more desirable because there are reports that similar fears are beginning to be expressed in friendly countries abroad.

Apparently, in our self-criticism of our shortcomings in the fields of rockets and technical education—as carried in the press and exported abroad—the impression has been created that we have been sitting on our technological hands—and are now wringing them over Russia's advances.

That Russia is momentarily ahead of the U.S. and its allies in long-range rocket development must be conceded, on the testimony of our own competent scientists. But we are hardly as impotent in other sectors of the military hardware department, as Rep. Clarence Cannon charged in a Congressional speech last week when he said that American superiority was confined to "super-carriers, tomahawks and scalping knives." And we are by no means behind the Soviets in the broad field of engineering and technology as some have implied, for example, in citing a few very large hydro developments under way in Russia, without pointing out that they are in nowise technically superior to what we and other countries have built.

It is probably such exaggerations and half-truths as these that have cast unjustified doubt on our technology. In so far as civil engineering and construction are concerned, at least, no visitor to Russia has yet come back with any feeling that the Soviets are doing more than we could do if faced with the same needs. Most certainly no visitor has found anything comparable to a Golden Gate Bridge, an Empire State Building, a Hoover Dam or a Chicago water filtration plant.

There should be no complacency with our technological position, but there should be no fear either that U.S. technology is no longer dynamic. We're not behind in anything but long-range missiles, and that won't be for long.

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Yet used to turn a tidy sum on every job he did.
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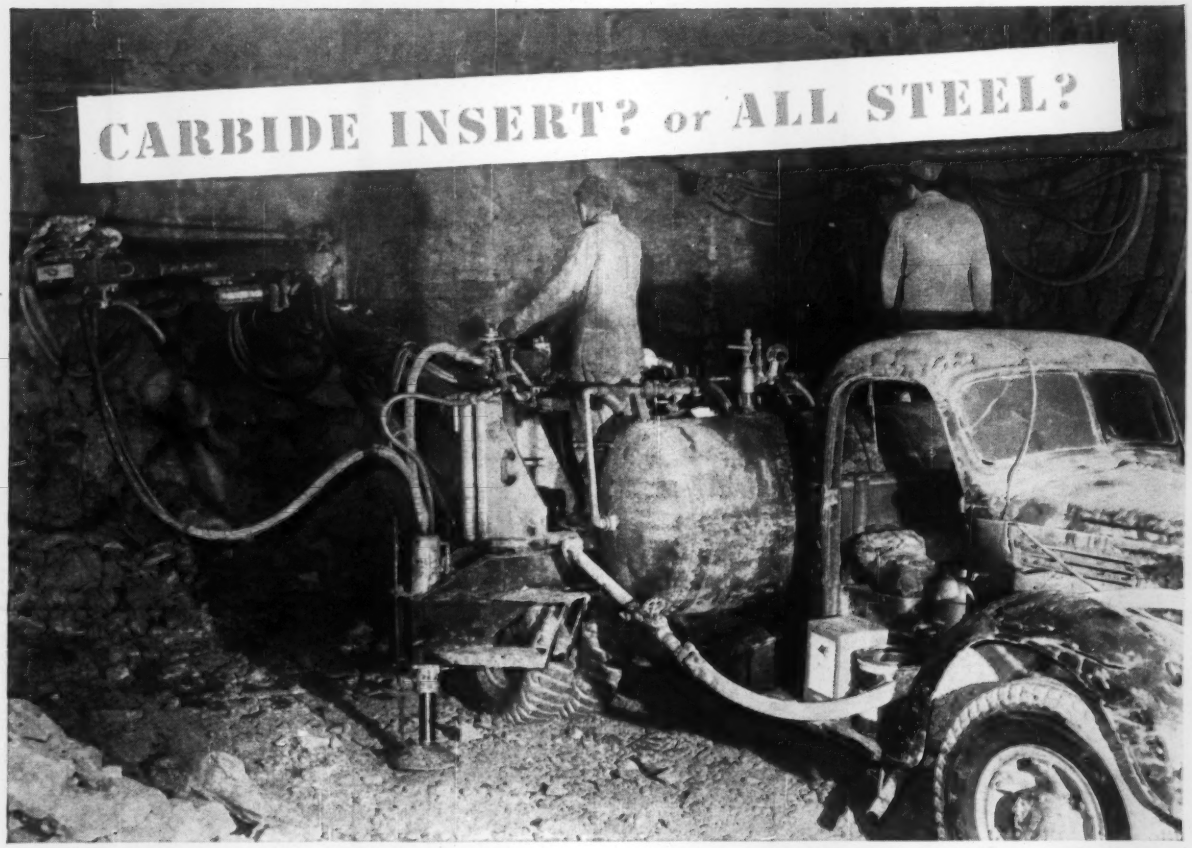

LOCATION: Limestone Quarry, Douds, Iowa

OPERATING CONDITIONS: Hard Limestone

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